

A Re-Analysis of NEG-RAISING in English

Jay M. Pollack

Contents

	Page
1. Introduction	190
2. The Syntactic Evidence and Its Problems	190
2.1. Until	192
2.2. Tag Questions	192
2.3. Parentheticals	194
2.4. The late rules	195
2.5. The ordering paradox	197
2.6. Summary	200
3. The Semantic and Illocutionary Problems Involved.	201
3.1. Predicates which allow NEG-RAISING	201
3.2. Illocutionary factors	202
3.3. Formalization	207
4. An Alternative Approach	208
4.1. Interpretive Semantics	208
4.2. Modal Structure	210
4.3. Formulation of the NEG-ASSOCIATION rule	217
4.4. Summary	220
5. Another Look at the Data	220
5.1. until	221
5.2. Tag questions	224
5.3. Parentheticals	225
5.4. The late rules	227
5.5. care and even	230
5.6. Ordering of the rule	234
6. Conclusions	235
Footnotes	236
References	238

A Re-Analysis of NEG-RAISING in English*

Jay M. Pollack

1. Introduction.

A rule of NEG-RAISING (also called NEG-TRANSPORATION, NOT-TRANSPORATION and NOT-HOPPING) was proposed originally in Fillmore (1963) to account for the similarity in meaning of (1a) and (1b).

- (1) a. John thinks Sally hasn't left.
- b. John doesn't think Sally has left.

Sentence (1b) is ambiguous. One of its meanings is the negation of (2).

- (2) John thinks Sally has left.

while the other meaning is the same as that of (1a). It was claimed that the deep structure of one of the readings of (1b) is the deep structure (1a) and that the not is raised from the complement clause to the main clause.

Since its original proposal, the rule has been used in several places as part of arguments in many different types of analyses. However, NEG-RAISING itself has never been sufficiently justified for one to be able to assume its existence, as many people have. This paper, in addition to reviewing the published syntactic arguments for NEG-RAISING and the problems they raise, will suggest that the rule would be more trouble than it is worth (part 2). After a brief look at the semantic and illocutionary factors involved (part 3), an alternative framework, namely, the one developed in Jackendoff (1972), will be adopted and a semantic interpretation rule of NEG-ASSOCIATION will be proposed to replace NEG-RAISING (part 4). Then the new framework and rule will be tested on the data which originally motivated the transformation (part 5), after which is a summary of the results of this paper (part 6).

2. The Syntactic Evidence and Its Problems.

2.1. Until

2.1.1. The word until seems to have the following selectional restrictions on it: it may appear in a sentence only with (a) a durative verb (compare (3a) and (3b))

- (3) a. Mary slept until noon.
- b. *Mary woke up until noon.

(b) with a plural subject, giving a punctual verb a durative sense (compare (4a) and (4b))

- (4) a. Guests arrived until 5 o'clock.
b. *The Brazilian ambassador arrived until 5 o'clock.

or (c) with a negative (Compare (5a) and (5b)).

- (5) a. I didn't get my present until Thursday.
b. *I got my present until Thursday.

Now consider examples (6)-(8)

- (6) *I think the trial will finish until next month.
(7) I think the trial won't finish until next month.
(8) I don't think the trial will finish until next month.

If sentence (8) were merely the negation of (6), then it would be ungrammatical, like (6) is. However, since (8) is grammatical, the argument goes, it must have come from (7) by NEG-RAISING, thereby satisfying the requirement that until co-occur with a negative in the same sentence.

2.1.2. The above data were first noticed by Klima (1964). He also found sentences like the following:

- (9) a. She is too weak to have another child until 1978.
b. Bill is afraid to leave until his mother comes.
c. I doubt he will arrive until next week.
d. My diet forbids me to eat until mealtime.
e. Scarcely anybody expected him to resign until next year.

None of these examples contains an overt negative anywhere in the sentence, yet they permit a construction with until. To handle these cases, Klima proposed a rule of NEG-ABSORPTION which, instead of raising a negative, would delete the lower negative, if there were a not or an 'inherently negative constituent' (into which class would fall forbid, too, afraid, doubt, scarcely) in the main sentence. Thus (8) would have a structure something like (10) and NEG₂ would absorb NEG₁, giving the surface structure of (8).

- (10) I NEG₂ think [the trial NEG₁ will finish until next week.]

This rule presents a problem for a theory in which transformations are meaning-preserving. Lindholm (1969) points out that sentence (7), which has the same meaning as (8), has a different underlying structure, namely, like (10), but without NEG. Thus, two synonymous sentences differ in that one, (7), has one NEG and the other, (8) has two NEGS on a more underlying level of representation. This would imply that NEG-ABSORPTION changes meaning.

There is another serious problem, as pointed out in Jackendoff (1971), for sentences that have a surface negative:

- (11) Bill is afraid not to leave.
 (12) Ali is too clever not to win.

If (11) and (12) have undergone NEG-ABSORPTION, then they must have started with two negatives in the auxiliary position in the lower sentence, which means that the base rules must be complicated, sacrificing a generalization about negation for an explanation of until.

2.1.3. If, instead of NEG-ABSORPTION, we try breaking down the inherently negative lexical items into more abstract semantic elements containing overt negatives in the lower sentence, as in (13),

- (13) a. so...that...not → too
 b. so afraid that...not → afraid
 c. tend to believe...not → doubt
 d. order...not → doubt
 e. almost no → scarcely any

then the sentences in (9) would satisfy the selectional restriction for until in deep structure and lexical insertion rules would apply later to give the surface items. This solution would not require two negatives to be generated in one simplex sentence by the base rules.

But even this solution cannot explain the ungrammaticality of (14a) and (14b).

- (14) a. *I don't doubt she will come until tomorrow.
 b. *Bill isn't afraid to leave until his mother comes.

Sentence (14a), which, by this proposal, would have a negative in the lower sentence with until, should be all right. If it is suggested that the negative in the main clause causes the lexical insertion rule which forms doubt to block, then sentence (15a) would also be prohibited, which is obviously not the case.

- (15) a. I don't doubt she will come.
 b. Bill isn't afraid to leave.

Calling don't doubt another special lexical item is an even more ad hoc solution and doesn't even seem plausible for the not afraid case in (14b)-(14b).

2.1.4. Selectional restrictions are generally agreed these days (cf. McCawley 1968, Jackendoff 1972:ch. 1) to be semantic well-formedness conditions, rather than syntactic, as was supposed in Chomsky (1965). If, as Jackendoff (1972) claims, surface structure contributes to the semantic representation of a sentence, then a syntactic rule of NEG-RAISING is not needed to account for sentences (6)-(15). Section 5.1 will demonstrate how this is done.

The until data, then, is not compelling evidence for the existence of the syntactic rule.

2.2. Tag questions

2.2.1. R. Lakoff (1969) discusses NEG-RAISING and tag questions. Tag questions are usually formed containing opposite polarity from the main sentence with respect to negativity, as in the following examples:

- (16) a. Joan is coming, isn't she?
b. Joan isn't coming, is she?

whereas tags with matching polarity are either 'ungrammatical or quite different in meaning, generally sarcastic'.

- (17) a. Joan has left, has she?
b. *Joan hasn't left, hasn't she?

Tags are usually permitted only on the top sentence:

- (18) a. Yogi hopes the Mets will win, doesn't he?
b. *Yogi hopes the Mets will win, won't they?

But under certain circumstances, they are permitted on the complement sentence:

- (19) I suppose the Phillies won't win, will they?
(20) *I suppose the Phillies won't win, don't I?
(21) *I don't suppose the Phillies will win, do I?

Lakoff says that the tag is formed from the lower sentence because suppose is being used as a performative¹ and for that reason, (20) and (21) are out, since performatives may not be questioned or negated. Now consider (22) and (23):

- (22) *I don't suppose the Phillies will win, won't they?
(23) I don't suppose the Phillies will win, will they?

In these sentences, suppose is used performatively, so the tag is formed from the embedded sentence. In (22), opposite polarity produces a bad sentence and (23) is acceptable, even though the tag matches in polarity and the performative seems to be negated. Lakoff claims that the not originated in the lower sentence and was moved by NEG-RAISING, so that when the tag is formed, the polarity will be opposite and the performative is not negated in deep structure. The apparent oddness of (23) is explained by deriving it from (19).

2.2.2. Jackendoff (1971) has two objections to this account. The first is that the verbs suppose, guess, imagine, and suspect, which would work in the examples (19) and (23) do not undergo NEG-RAISING in the following examples.

- (24) Steve { supposed
 imagined
 guessed
 suspected } that the Phillies hadn't won.

- (25) Steve didn't $\left\{ \begin{array}{l} \text{suppose} \\ \text{imagine} \\ \text{guess} \\ \text{suspect} \end{array} \right\}$ that the Phillies had won.

There are many speakers for whom the sentences in (25) are not paraphrases of those in (24), so NEG-RAISING cannot be at work here (in a theory where transformations are meaning-preserving).

Secondly, for most NEG-RAISING verbs, the model (19) and (23) is fine, but for think and believe, we get:

- (26) a. I don't think they'll win, will they?
b. I don't believe they'll win, will they?

These should have come from the very much worse (27)

- (27) a. *I think they won't win, will they?
b. ?*I believe they won't win, will they?

Since NEG-RAISING is optional, these last two ought to be good, but for some reason, they aren't.

These problems put a question on the whole tag-question argument, and they raise doubts as to whether tag questions are really that simple a matter at all. (See sections 3.2.4 and 5.2 for some discussion). Even if independent evidence shows that NEG-RAISING is indeed a transformational rule, how can these examples be explained?

2.3. Parentheticals

2.3.1. Ross (1973) notices that the class of verbs which can appear as final-position negative parentheticals is the same as the class that undergoes NEG-RAISING, as demonstrated in (28)

- (28) a. We're not in Lompoc yet, I don't think.
b. *We haven't reached a conclusion, we didn't claim.

Since, as Ross claims, negative parentheticals, unlike positive ones, may only occur after negative sentences as in (29),

- (29) a. *Harvey has eleven toes, I don't think.
b. The fiscal year had (not) been encouraging, they realized.

Ross proposes that NEG-RAISING be split into two parts, NEG-COPYING, while optionally copies a negative from an embedded sentence to the upper sentence whose main verb is think, guess, believe, etc. and NEG-DELETION which deletes the lower NEG when a copy has been made.

2.3.2. There have been other cases in the literature where movement rules have been claimed to be really a copying rule plus a deletion rule (for example, Perlmutter 1972). The question has been raised as to whether all movement rules might not be reanalyzed in this way. If this were to be the case, then the constraints mentioned in Ross (1967) which apply to chopping rules would really be constraints on

deletions. Neubauer (1970) claims that some deletion rules violate Ross's constraints, but his examples are not compelling. In the case of NEG-DELETION, this would never come up anyway, since the original NEG-RAISING rule was not an unbounded movement rule.

There are still problems with the copy-plus-delete analysis, however. In general, the deletion rules would all have to mention the same environments as their partner copying rules and must obligatorily² apply to delete the original constituent after it is copied. Thus NEG-DELETION is obligatory, providing that the complement structure necessary for NEG-COPYING has not been disturbed by the intervening (in Ross's analysis) rule SLIFTING, which preposes the embedded sentence. That these same conditions should apply to all these deletion rules seems questionable.

There is an additional problem for NEG-DELETION. Most of these deletion-of-a-copy rules will not find their structural descriptions met unless the copying rule has just applied. But Ross notes that sentences with two NEGs can exist without the copying rule. In these cases NEG-DELETION must not apply, even though its structural description is satisfied. Thus (30a) must be prevented from becoming (30b)

- (30) a. I NEG believe [we NEG will have a recession.]
b. I don't believe we will have a recession.

This is the same problem encountered by NEG-ABSORPTION (see section 2.1.2), to which NEG-DELETION bears a strong resemblance.

Jackendoff's (1972) discussion of an alternative treatment of parentheticals will be brought up in section 5.3.

2.4. The late rules

2.4.1. Lindholm (1969) briefly mentions sentences like

- (31) I don't think John loves Marsha anymore, but she doesn't realize it yet.

The it presumably refers to the clause John doesn't love Marsha anymore and is inserted by a rule of SENTENCE-PRONOMINALIZATION. For this pronominalization-under-identity rule to have applied, the first part of (31) must have, at some point in the derivation, contained the phrase John doesn't love Marsha anymore in order for the identity to have obtained between it and the same phrase in the second conjunct. After SENTENCE-PRONOMINALIZATION applies, NEG-RAISING lifts the negative in the first conjunct.

2.4.2. Observe the following phenomenon:

- (32) a. He's coming and I can guess why he's coming.
b. He's coming and I can guess why.

Sentence (32b) comes from (32a) by a rule, described in Ross (1969), called SLUICING, which deletes all of the last clause except the question word (and a preposed preposition, optionally) when it is an embedded question and identical to another part of the sentence (or of

a previous sentence). The sentences in (33) show that the not of why...not may also optionally be undeleted, although why not is obviously wrong where there was no original negative, as in (33d).

- (33) a. He's not coming and I can guess why he's not coming.
 b. He's not coming and I can guess why.
 c. He's not coming and I can guess why not.
 d. *He's coming and I can guess why not.

Sentence (34) shows that SLUICING may also delete under identity with an embedded sentence.

- (34) I know he's not coming and I can guess why not.

But now consider (35), where there is no surface not in the embedded sentence:

- (35) I don't think he's coming and I can guess why not.

The why not is apparently a sluiced form of why he's not coming. This suggests that the first part of the sentence contained the phrase he's not coming at the point when SLUICING applied, otherwise there wouldn't be any identity to allow SLUICING.

Notice that in sentence (36),

- (36) Mary doesn't think he's coming and I can guess why not.

the why not can refer to the main verb (i.e. SLUICING might have applied to I can guess why Mary doesn't think that...), but this reading doesn't make sense in (35), where the not supposedly originates in the lower sentence and NEG-RAISING takes place after SLUICING.

2.4.3. In the following sentences

- (37) a. *The Phillies will win and the Mets won't win either.
 b. The Phillies won't win and the Mets won't win either.
 c. The Phillies won't win and neither will the Mets.

it is seen that for either to appear, there must be a negative (or an implied negative) in both clauses. And for neither to appear, in addition to negativity in both conjuncts, the VP parts of the conjuncts must be identical (cf. Klima 1964), since the rule of VP DELETION (defended in Ross 1969), which deleted a VP on identity to a VP in another conjunct, as in (38),

- (38) The Phillies will win and the Mets won't.

would accompany the neither-fronting. Thus (37b) is an earlier form of (37c). Now consider (39)

- (39) I don't think the Phillies will win and neither will the Mets.

At the point in the derivation where the neither is to be fronted, the two conjuncts must be identical and negative. A deeper structure for (39) might be (40).

- (40) I think the Phillies won't win and the Mets won't win, too.

This implies that too, which appears in positive conjunctions, changes to either in negative cases and that the change to a fronted neither includes VP DELETION (and its requisite identity of the conjuncts) at some point. Even if these details are not exactly right, the argument is the same. The not must have originally been in the embedded sentence and NEG-RAISING applies after the conditions for neither are met.

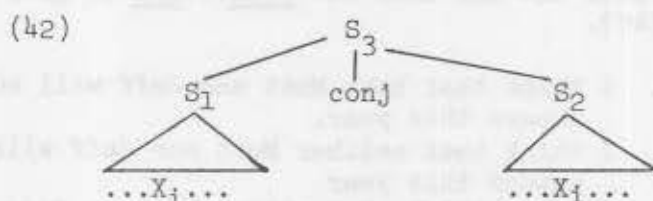
2.5. The ordering paradox

2.5.1. What the three rules discussed in section 2.4 have in common is the following: They all apply to conjoined structures, and the deletions or anaphora that occur as a result of their application all take place (optionally) under identity between the deleted material and some other part of the sentence. If there is no rule of NEG-RAISING, the 'identity' under which these deletions would occur must be modified. See section 2.5.4. for a discussion of this possibility.

2.5.2. Without a redefinition of 'identity', a previously unnoticed problem arises. Lakoff (1970) claims that NEG-RAISING is cyclic, as seen with sentences of the type (41).

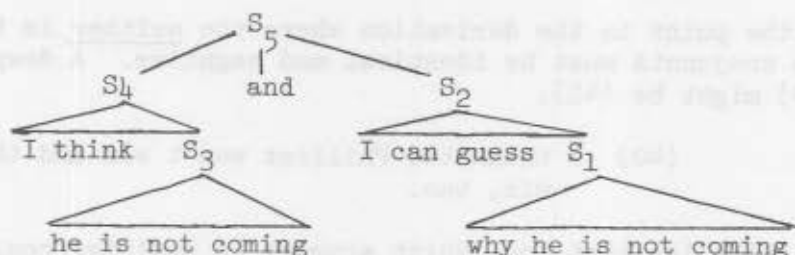
- (41) a. I think Cliff believes Susan doesn't love him.
b. I think Cliff doesn't believe Susan loves him.
c. I don't think Cliff believes that Susan loves him.

But consider the example sentences in section 2.4. The structure of these sentences is (very generalized) like (42).



If NEG-RAISING is cyclic as suggested, it would apply on the S_1 and S_2 cycles before the S_3 cycle. However, the examples in section 2.4 show that NEG-RAISING must follow the three rules, all of which would not apply until the S_3 cycle is begun and all S_1 and S_2 cycle rules have finished. For example in sentence (35), the structure would be (43).

(43)



If NEG-RAISING is cyclic, it should apply on the S_4 cycle and SLUICING should apply on the S_5 cycle. But we have seen that NEG-RAISING must follow SLUICING on the S_5 cycle.

2.5.3. Having NEG-RAISING apply on the S_5 cycle means one of two things: (i) NEG-RAISING is not following the principle of strict cyclicity (cf. Chomsky 1973), which states essentially that 'rules cannot in effect return to earlier stages of the cycle after the derivation has moved to larger, more inclusive domains' (p. 243); or (ii) NEG-RAISING is a post-cyclic rule, which means that it need not follow the strict cyclicity principle.

2.5.3.1. But there are problems with both of these alternatives. Even though the sentences in (41) are consistent with a post-cyclic NEG-RAISING rule. (ii) cannot be the case for the following reasons.

Consider the following pairs of sentences:

- (44) a. Both Mutt and Jeff think that this theory won't last until Thursday.
 b. Both Mutt and Jeff don't think that this theory will last until Thursday.
 c. Neither Mutt nor Jeff thinks that they theory will last until Thursday.

In the derivation (44a) to (44b) to (44c) NEG-RAISING must precede the rule that incorporates the NEG into the both...and to give neither...nor. However in (45),

- (45) a. I think that both Mutt and Jeff will not give LSA papers this year.
 b. I think that neither Mutt nor Jeff will give LSA papers this year.
 c. I don't think that either Mutt or Jeff will give LSA papers this year.
 d. I don't think that both Mutt and Jeff will give LSA papers this year.

the rule incorporating the NEG must precede NEG-RAISING in order to get from (45a) to (45b) to (45c). If NEG-RAISING applied first to (45a), then (45d), which is not synonymous to it, would result.

The fact that two rules must apply in both orders is the usual argument for the cyclicity of the rules.

Also consider the fact that in (41), if NEG-RAISING works post-

cyclically, then it should move the negative in an all-at-once movement. But for the rule to work at all, the correct lexical items must be present in all the correct places. This would mean that the rule was subject to a Boolean combination of the lexical items which allow it to operate. This type of rule government has been disfavored, even by its original proponent (G. Lakoff 1970b, Preface) in favor of global constraints. Thus, a post-cyclic NEG-RAISING rule would have to be much more complicated in order to be able to iterate. Therefore, NEG-RAISING is cyclic.

2.5.3.2. If it is cyclic, we can first of all consider the possibility of its being highest-trigger cyclic. This runs into the same problem just given above: it must iterate.

It might be claimed that NEG-RAISING could be both highest-trigger cyclic and iterative, i.e., that it moved the negative up one sentence at a time (checking for the appropriate environment on each cycle), but that it only applied on the trigger cycle and repeated itself until it reached the trigger cycle.

But this means that the rule would be applying to a clause subordinate to the main clause of that cycle. Jackendoff (1972: ch. 9) goes through some examples of the following type to show what would happen if rules could iterate like this.

Suppose we have a sentence like (46)

(46) Anita said that Ruth passed the pipe to Bonnie.

On the first cycle, PASSIVE applies giving (47).

(47) Anita said that the pipe was passed to Bonnie by Ruth.

On the following cycle, PASSIVE's structural description is met again. A NP may often be passivized from a PP directly following the verb as in The bed was slept in by Kilroy. If PASSIVE applies again, the result is (48)

(48) *Anita said that Bonnie was been passed to by the pipe by Ruth.

which is obviously an ungrammatical sentence. So there are good reasons why transformations must not be allowed to iterate. This is the motivation behind the strict cyclicity principle.

If the NEG-RAISING rule is successive cyclic, having it follow SLUICING in (35) also violates the strict cyclicity principle. Also in this case, there is the problem of how to prevent NEG-RAISING from applying on the S_4 cycle, which comes first. If the claim is made that SLUICING, VP DELETION or SENTENCE PRONOMINALIZATION are post-cyclic, then an ordering paradox exists. Notice that having non-extrinsically ordered rules will not help here, since even most people who do not accept ordered rules accept the notion of the cycle--and a cyclic rule which must follow a post-cyclic (or at least higher-cyclic) rule will still produce a paradox.

Faced with these obstacles, the condition on identity must be changed.

2.5.4. If we can redefine the 'identity' under which the anaphora rules work, then we can allow NEG-RAISING to apply first and then let the rules apply under our newly defined identity. This has been proposed by Grinder and Postal (1971), where they say 'grammars must allow certain transformations to apply at one point in a derivation to some phrase marker PM_i , subject to a semantic identity condition statable only at a different stage of the derivation on the phrase marker PM_j , where PM_i and PM_j are non-contiguous. The link between these two stages is the notion of corresponding constituent...and has been described... as a Global Derivational Constraint'.

Specifically in this case, the identity condition on SLUICING and the others will be something like (49).

- (49) Two conjuncts which differ only in that the first has had a negative raised out of it by an application of NEG-RAISING while the second conjunct retains the negative will be considered identical for the purpose of the rule.³

So, NEG-RAISING will be cyclic and precede all of these rules, but will not affect the identity under which the anaphora is created.

Compared with some of the derivational constraints that have appeared in the literature, (49) is not that unusual (assuming that the modifications mentioned in footnote 3 and any others that might be discovered can be implemented without too much trouble), but then there will be no way to prevent sentence (50).

- (50) *Bill didn't believe that John would come until tomorrow and I believed it, too.

G. Lakoff (1970a: footnote 5) specifically deals with this sentence and says that it is prevented by the fact that SENTENCE-PRONOMINALIZATION may not occur in this case because the two conjuncts are not identical. NEG-RAISING has applied in the first but not the second, so there is a not in the second conjunct not present in the first. But this is just the condition described in (49). In order for sentence (31) to be generated, condition (49) is necessary. So the condition must be modified somehow to exclude (50). There may be a way to do this, but it would most likely complicate the condition to the point where it looks much more unwieldy and ad hoc than before.

2.5.5. To sum up this section, proponents of a NEG-RAISING transformation are faced with either an ordering paradox or a fairly complicated global condition on identity for the anaphora rules.

2.6. Summary

In this section, I have presented the published syntactic arguments for the rule of NEG-RAISING and the problems they create. None of the

arguments is free of troubles, which makes the rule highly suspect, based on the existing syntactic evidence. In addition, the ordering paradox or its alternative is a serious complication the analysis must face.

After I have attempted to formulate the process as a semantic interpretation rule, I shall return in section 5 to each of the sets of data mentioned here to see how they would be handled in the Interpretive Semantics framework I am using. It will be seen that in some cases, the interpretive rules have fewer troubles, although in other cases there are the same problems as in the (largely) Generative Semantics approach used so far.

3. The Semantic and Illocutionary Problems Involved.

3.1. Predicates which allow NEG-RAISING

3.1.1. It is well known that NEG-RAISING cannot apply in every sentence with a complement clause. The specific predicates which allow it are few in number. G. Lakoff (1970b) refers to NEG-RAISING as a minor rule. The predicates which undergo the rule fall into three separate syntactic classes:

- (51) think, believe, suppose, expect, imagine, guess, suspect, reckon, see⁴, anticipate, predict?, fancy?, figure?
- (52) want, plan on, intend, wish, feel like, choose, contemplate, be supposed to, mean?⁵.
- (53) seem, appear, be likely, be probable?, look like, figure to.

3.1.2. The question has been raised whether these predicates form natural semantic classes or disjunctions of classes. G. Lakoff (1970a) claims that they don't, due to the fact that some people don't have all of these as NEG-RAISING verbs. He also says that if there were semantic classes, they would be cross-language classes. Since hoffen in German is a NEG-RAISING verb, while hope in English isn't, this falsifies the claim that there is a semantic class, Lakoff says. Therefore the rule is governed by predicates marked for it, whether it is a syntactic or semantic rule.⁶

Nevertheless, simply marking the individual verbs as undergoing the rule or not is a very arbitrary method and makes the claim that these predicates are all learned as exceptions to the usual case (i.e., NEG-RAISING is not allowed). Intuitively this seems to be wrong. It would be very convenient to say that one can predict from the meaning of a verb whether or not it will allow NEG-RAISING.

Some things can already be said about the types of predicates that are or are not in these classes. Kiparsky and Kiparsky (1970) note that factive verbs may not undergo NEG-RAISING. G. Lakoff (1970a) attempts to explain this with an idea from Dwight Bolinger that the farther away the negative is moved from the verb it negates, the more uncertainty there is concerning the assertion. For example, (54a) and (54b):

- (54) a. Susan thought Marilyn hadn't left.
 b. Susan didn't think Marilyn had left.

For a factive, there is a presupposition that the complement is true, so the subject of the sentence could not be uncertain about it. Horn (1971) suggests this be extended to include implicative verbs (cf. Karttunen 1971). Thus, the substitution of realize in (54a) and (54b) results in non-synonymy.

These explanations seem reasonable in the absence of anything better, so it seems quite more likely that the classes of NEG-RAISING verbs are natural classes. Individual speakers may allow or disallow some members of the classes, but those are just individual variations. As a result, the fact that someone might not have NEG-RAISING for anticipate is an accident; the fact that they don't have it for realize or even claim is not an accident.

3.1.3. In conjunction with Bolinger's comment above, Lakoff mentions that there is nothing in the theory which predicts that the more certain assertion is when the negation is nearer the verb it negates. It could just as easily be the other way around. It has been suggested to me (Arnold Zwicky, personal communication) that there may be a perceptual factor involved, in that it might be harder to associate a negative with a verb if they are separated. This would claim that the farther away the negative moves, the less the certainty of the assertion, which is what happens.

If it is not a perceptual matter, then the fact remains that (54a) and (54b) are not exactly synonymous. In a theory where transformations preserve meaning, this lack of synonymy implies different deep structures. Therefore for sentences like (54b) the rule is obligatory and sensitive to some semantic information. Lakoff, who notices this problem, makes no suggestions as to what information the rule should be sensitive to and I don't see either how to mark a sentence as undergoing NEG-RAISING (without resorting to an ad hoc feature which is only present for NEG-RAISING verbs). Neither do I have any way of indicating in an Interpretive Semantics framework how strong a negative is. This makes Zwicky's solution more pleasing, in that it is compatible with either framework.

When better accounts of actual meanings of words are given, this may enable a more general statement of what kinds of verbs allow NEG-RAISING to be made. Until then, there are only vague ideas as to the characteristics of the semantic classes involved. See Horn (1975) for some additional discussion.

3.2. Illocutionary factors.

3.2.1. Lindholm (1969) notices that the verb believe, normally a NEG-RAISING verb, does not undergo the rule in some of its uses. He distinguishes two senses, believe it and believe so and notes that NEG-RAISING only applies to believe so, as in (55).

- (55) a. Bill believes that Betty won't come and I don't believe so, either.
 b. *Bill believes that Betty won't come and I don't believe it either.

He tries to set up two different underlying predicates for the two senses of believe, one being have the opinion that S, the other being accept the claim that S. Only the have the opinion predicate would be marked for NEG-RAISING.

3.2.2. Kimball (1970) puts this observation into a much larger perspective. He distinguishes two types of utterances, expressive and reportive. Roughly, expressives are expressions of states of mind, reportives are assertions. Some examples will help to illustrate.

The sentence 'It hurts' can be used as an expression of pain, much like a groan might. On the other hand, the same sentence can be used to assert that pain is felt. In the expressive sense (the first case), it does not deal with the truth value of any proposition. In the second case, the reportive sense, the sentence could be used as an answer to a question, 'Does it hurt?'. In other words, it is asserting the truth or falsity of a proposition.

For another example, take sentence (56).

(56) I think this milk is spoiled.

Sentence (56) can be uttered as the response to two different questions (57a) and (57b).

- (57) a. How's the milk doing?
- b. What do you think about the milk?

As the answer to (57a), (56) makes a medged assertion about the milk, so it is expressive. As the answer to (57b), (56) is an assertion about what the speaker thinks, hence it is reportive. Notice that (56) can be answered in two ways each responding to one of the senses.

- (58) a. Well, it isn't; we just got it. [response to expressive]
- b. No, you don't; you just told Mary that it is fine. [response to reportive]

It can be seen that as an expressive (56) makes an assertion about the milk; as a reportive, it makes an assertion about the speaker's having a belief towards some proposition.

Since an expressive I believe... makes no assertion about the speaker, it cannot be questioned or negated. They may make expressive sentences seem like performative sentences (Austin 1962). Performatives must occur in present tense and in first person. But the following examples show that expressives may appear in past tense or in other persons.

- (59) a. Jerry believes there will be a recession.
- b. I thought we could keep our clothes on for this.

The answers to these sentences in their expressive and reportive senses, respectively, would be (60a) and (60b).

- (60) a. No, there won't; no we can't.
- b. No, he doesn't; no you didn't.

So expressives are not as restricted as performatives.

This expressive-reportive distinction conditions the choice of the pronoun so or it, as in (61a) and (61b)

- (61) a. He says Nixon has resigned, but I don't believe it. [reportive]
 b. He says Nixon has resigned, but I don't believe so. [expressive]

3.2.3. Kimball claims that only expressive sentences may undergo NEG-RAISING. This would explain Lindholm's facts about believe so vs. believe it. Furthermore, Kimball says that the expressive quality cannot reside in the individual lexical items themselves, but must be a quality of the whole sentence. If this were not so, then each of the NEG-RAISING verbs would have to be marked as ambiguous, with only one of the meanings allowing NEG-RAISING. If an important generalization is not to be lost, we must say that all of these expressive verbs must have some semantic characteristics in common.

Herein lies the problem. How is the expressive character of a sentence to be represented formally? This point will be taken up again shortly.

3.2.4. The expressive-reportive classification is capable of explaining several other phenomena.

As is well known, all English modal verbs have two meanings, root and epistemic. For instance may:

- (62) He may eat his dinner. [root meaning = permission]
 [epistemic meaning = possibility]

Most of the modals (can, must, might, will, should, etc.), used epistemically, denote some kind of possibility or probability; thus the sentences they are in have some kind of truth value. Therefore they must be reportive. So, no expressive sentence may contain an epistemic modal.

Furthermore, since the predicates used in sentences with NEG-RAISING are stative, they cannot take root modals, either. This means that the presence of any modal verb in a sentence will block NEG-RAISING. And this is so; compare (63) with (64) and (65)

- (63) a. She believes that he doesn't cheat on her.
 b. = She doesn't believe that he cheats on her.
 (64) a. She can believe that he doesn't cheat on her.
 b. ≠ She cannot believe that he cheats on her.
 (65) a. She may believe that he doesn't cheat on her.
 b. ≠ She may not believe that he cheats on her.

It also seems that expressiveness may have something to do in tag questions. R. Lakoff (1969) claims that the ungrammaticality of sentence (66) is due to the fact that suppose is being used as a performative and performatives may not be questioned (or tag-questioned).

- (66) *I suppose the Phillies will win the pennant, don't I?

She claims that in these performative cases, and only in these, the tag is formed from the complement sentence, viz. (67).

(67) I suppose the Phillies won't win, will they?

She generalizes this to all normal cases, in which she claims the tags are formed one sentence down from an abstract performative. Her explanation for why (68) has the tag formed after NEG-RAISING,

(68) Steve doesn't suppose the Phillies will win, does he?

whereas from (67) the tag-formation precedes NEG-RAISING, is that both tag-formation and NEG-RAISING are cyclic rules and in (67) and (68) tag-formation is applying on different cycles.

But Kimball shows that tag-questions cannot be based on performatives, using sentences like (69).

- (69) a. I imagine they'll win, won't they?
 b. I think they'll win, won't they?
 c. I believe they'll win, won't they?

where think, imagine and believe cannot be considered as performatives.

These sentences, while not performative, are expressive. It seems that the tag is formed on the sentence that is asserted. In (68) the main clause is asserted, so the tag is based on it; and in (67) the complement is asserted, so the tag is based on the complement.

Hooper (1974) discusses the cases where tags may be formed on a complement clause. She distinguishes classes of verbs which allow this; the classes of hers which are of interest are the weak assertive verbs and the semi-factive verbs. The weak assertives are the group listed above in (51) as NEG-RAISING verbs. The semi-factives, which do not allow NEG-RAISING, are shown in (70) and (71).

(70) know, notice, see, observe, realize, recall, etc.

- (71) a. I know you've been at the cookies again, haven't you?
 b. I notice the refrigerator is leaking, isn't it?
 c. I realize he's just eaten 42 eggs, hasn't he?
 d. I recall she was a lumberjack then, wasn't she?

Hooper (13) adds the condition for complement tags that it must be a 'speaker assertion'. All of the sentences in (71) will be bad if I is replaced by Harry or if the main clause is put into past tense. In addition, some other members of the semi-factive class, discover and find out, do not allow complement tags because they cannot be used in first person present assertions. This is the case as with the NEG-RAISING verbs. Notice that the sentences in (72) are bad.

- (72) a. *Steve doesn't suppose the Phillies will win, will they?
 b. *I believed the Flyers were winning, weren't they?

What this suggests is the semi-factives, like the NEG-RAISING verbs, may be used in both expressive and reportive sentences. Hooper's assertive/

non-assertive distinctions are important, but they crosscut the expressive/reportive distinction rather than replace it. Complement tags can be formed only in expressive sentences which contain these two classes of verbs, the semi-factives being of no further interest to us here.

The foregoing answers one of Jackendoff's complaints to the tag argument given in section 2. He claimed that verbs like suppose, guess and others, which allow NEG-RAISING in frames like (67), do not allow NEG-RAISING (for many speakers) in sentences like (73).

- (73) a. Steve didn't guess that the Phillies would win.
b. Steve guessed that the Phillies wouldn't win.

Obviously, for people who feel that (73a) and (73b) are not synonymous, guess is not being used expressively there. If it were, then NEG-RAISING would be allowed and the sentences would mean the same thing. For some speakers, (73a) and (73b) do share a reading, and in that case, guess is being used expressively.

I also claim that the anaphora rules discussed in section 2.4 are sensitive to the expressive-reportive distinction. Compare (74a) and (74b):

- (74) a. I believe she is coming and I can guess why.
b. Barbara regrets she is coming and I can guess why.

In (74a), the why has the preferred reading why she is coming, although the reading why I believe... is possible. In (74b) the reading why Barbara regrets... is strongly preferred to why she is coming. This seems to parallel the tag-question case somewhat. In the preferably expressive (74a), the complement is what is asserted, so it is more likely to be what the sluiced clause refers to. (74b) must be reportive, and the sluiced clause refers again to what is asserted, the main clause. Note that the possible reading of (74a) as why I believe... exists because I believe may also be reportive. I would claim therefore, that the anaphora rules may use embedded clauses as antecedents only in cases where the clause is what is asserted. The number of verbs which allow this is larger than the number which allow complement tags (see Hooper and Thompson (1973) for more discussion), but it is possible only when the verbs are being used in an expressive sentence. So it seems like the bifurcation of sentences into expressive and reportive may have effects in several areas of the grammar.

3.2.5. By saying that only expressive sentences undergo NEG-RAISING, predictions are made about the sense of some sentences. Thus, if a sentence with a NEG-RAISING verb fails to undergo NEG-RAISING, the prediction is that the sentence is not an expressive one. Likewise, if a sentence fails to allow a tag on the complement clause, the claim is that it is not an expressive sentence. We will see examples like this in section 5.

Some interesting facts discovered by Clinkenbeard (1969) need explaining. The following sentence with believe has undergone PASSIVE and is not ambiguous.

(75) That Hildy is coming is not believed by Joel.

Kiparsky and Kiparsky (1970) explain sentences like this by the fact that the complement sentence is in subject position and in this position it tends more towards being presupposed. This must mean that (75) is reportive, which explains the non-ambiguity, since NEG-RAISING could not have applied.

However, if EXTRAPOSITION applies, the complement is no longer presupposed and the sentence may be expressive (i.e., NEG-RAISING may apply). RAISING may also be applicable. Notice the sentences in (76).

- (76) a. It is not believed by Joel that Hildy is coming.
b. Hildy is not believed by Joel to be coming.

The predicates seem and appear cannot be used reportively, so their complements must be asserted. Therefore subject complements with are not allowed (cf. (77)).

- (77) a. *That Amy is not home seems.
b. *That Izzy has closed the store appears.

These sentences are acceptable if EXTRAPOSITION and RAISING have applied.

Just why the subject complement sentences may not be expressive is not clear to me. Hooper (1974) has some discussion of this, but the matter is far from settled. See also section 4.3.4. for more on some of these sentences.

3.3. Formalization

As mentioned earlier, there is little in the way of formalization for the difference between expressive and reportive sentences. Kimball mentions some mechanisms in a Generative Semantics framework that won't work. In particular, the theory of exceptions is unequipped to distinguish between expressive and reportive believe by means of a mark on the lexical item. This solution again suggests that it is a completely arbitrary choice of verbs which would be so marked and it makes no claims about the semantic nature of the verbs; it would just be a change that believe as opposed to realize has two lexical entries, one of which is marked for NEG-RAISING.

Kimball says that the class of NEG-RAISING verbs is semantically defined as the class which may be used expressively. We have seen that the class which may be used expressively is larger than that. The semantic classes of Hooper and Thompson do not solve the problem, but just give it a new name, although they do show that a semantic answer is probably the right one, contra Lakoff. There is still no mechanism in the theory which will allow one to predict a verb's behavior with respect to NEG-RAISING from its semantic content.

It is not obvious to me how this could be done in the Interpretive Semantics system described in the next section, either. A few ideas will be suggested in section 4.2.6. In the meantime, I will merely refer to an expressive sentence without actually indicating a formalism, in the absence of a good one. I would hope that this inexplicitness has no significance for the rest of the discussion, and will not affect any of the results I obtain.

4. An Alternative Approach.

In this section I will describe the general theoretical framework within which I am working towards a description of the data. The grammar I am using is basically that described in Jackendoff (1972). I will provide a brief sketch of it, with special emphasis to the modal structure, which is the part concerned with negation in general. I will then attempt to formulate a semantic interpretation rule which I call NEG-ASSOCIATION to replace NEG-RAISING. The question of how this rule contributes to the semantic representation of a sentence will be more fully discussed in section 5.

4.1. Interpretive Semantics⁷

4.1.1. In the first works on generative grammar, the derivation of the meaning of a sentence from its syntactic structure was not dealt with. It was not until Katz and Fodor (1963) that generative grammarians began to look at the problem of how to relate meaning and form. Katz and Fodor developed the idea of projection rules which contribute to the semantic representation of a sentence, that part which is not traceable to the lexical items themselves, but instead arises from how they are combined syntactically. Each phrase structure rule and transformation would have with it an associated projection rule which would explain how the syntactic rule affects the meaning of a sentence which uses it in its derivation.

Katz and Postal (1964) attempted to show that none of the transformations change the meaning of the sentence, hence they need not have any projection rules associated with them. From this, they proposed that all necessary semantic information was present in the deep structure.

The logical result of extending this proposal is to claim that there is no level of deep structure separate from the semantic representation, and that the base rules actually generate the semantic structure of the sentence. This claim has been made (at least implicitly) in several places (e.g. G. Lakoff 1971, McCawley 1968) in some form or other. This was the framework adopted in section 2 of this paper.

On the other hand, if it could be shown that the semantic representation of a sentence must be determined from more than one level of representation, then the deep structure would not contribute the entire meaning. There could be semantic interpretation rules operating on the surface structure (or some other level) to add to the meaning of a sentence. This is the approach taken by Chomsky (1971) and Jackendoff (1972) among others. Jackendoff, in particular, has a fairly complex idea of semantic representation, for which he develops several kinds of semantic interpretation rules (described below).

The overall intent of this type of framework is to show that if rules of semantic interpretation can be formulated properly, their properties and the properties of the semantic representations they derive can be used to account for [many] semantic phenomena, leaving the syntactic component as free of semantic intervention as it was in Syntactic Structures' (Jackendoff 1972: Preface).

4.1.2. Jackendoff mentions four aspects of semantic interpretation, which,⁸ while related in some ways, are reasonably independent of each other.

First is the functional structure, which is read from the deep structure of the sentence. Each verb can be considered a semantic function with various noun phrases as arguments. The lexical entries for verbs will have them broken down into subfunctions like CAUSE or BECOME or directional functions. The projection rules will insert the NP's as arguments into the functions and generate a functional structure for a sentence. A system of 'thematic relations' developed in Gruber (1965) is utilized to explain various syntactic and semantic phenomena in a more satisfying manner than can be done with traditional grammatical relations alone or with case relations à la Fillmore (1968).

Another element of the representation is coreference relations among noun phrases in the sentences. A table of coreference is set up, containing an entry for each pair of NP's in the sentence with the mark 'coreferential' or 'noncoreferential'. This information is claimed to be of a different nature from the functional structure, so it is represented as a separate part of the semantic representation.

Another contributor to meaning is focus and presupposition, where focus and presupposition can very loosely be characterized as the new information and the old information a sentence contains. If a sentence receives a different focus by way of contrastive stress, the functional structure is still the same. Focus and presupposition can be largely read from the surface structure.

The fourth element of semantic representation is the modal structure, which is another hierarchical structure. This is the structure that explains 'the conditions under which a sentence purports to correspond to situations in the real world' (Jackendoff (1972: 3). This element of semantic interpretation will be discussed in greater detail below.

Once these separate elements have been assembled for a sentence, there has to be a way to determine whether there is a meaning that can be drawn from them. This is done by means of well-formedness conditions on semantic interpretation, which specify which sentences do not have sensical meanings. One such example is selectional restrictions, which are applied only after the entire reading has been formed.

It is at this point where the shading between linguistic and extra-linguistic knowledge takes place. So (78) is out because of linguistic knowledge (or is it?), but (79) is rejected only on the basis of a mathematical theorem.

(78) Yesterday I discovered an odd integer divisible by two.

(79) Yesterday I discovered the highest prime number.

In this area there are obviously many details to be worked out (such as the formal nature of selectional restrictions, for instance) but these are difficult problems in anybody's theory and they are beyond the scope of this study.

Since selectional restrictions are assigned to semantic representations, the process of lexical insertion is simplified. Complex symbols expressing the selectional restrictions, as used in Chomsky (1965), are not necessary. Lexical insertion will be free under category symbols.

Another obvious well-formedness condition is that if two noun phrases are marked coreferential they must be able to represent the same individual; hence (80) is unacceptable.

(80) *My mother respects himself.

The only possible referent for himself is my mother but since the two NP's have different genders they cannot be coreferential, so (80) violates this well-formedness condition and is rejected.

There are several other well-formedness conditions on semantic representations. These allow the transformations and the semantic interpretation rules to operate without complex conditions on their application, since the sentences with anomalous readings can be weeded out at the end of the derivation.

4.1.3. Basically the syntactic component is the same as Chomsky (1965) with the difference in lexical insertion noted above. Jackendoff assumes an extended version of Chomsky's (1970) Lexicalist Hypothesis. Node labels are represented as being composed of distinctive features. Transformations may not change node labels or perform derivational morphology. This Lexicalist position excludes lexical decomposition (see section 2.1.3). Derivational morphology is handled by redundancy rules in the lexicon (cf. Jackendoff 1975b).

Jackendoff also claims that the best solutions to a problem should increase the information content of the lexicon as little as possible. He eschews the use of exception features where a difference in syntactic behavior is related to the meaning of the items in question, since in that case, the rule need only refer to the meaning of the item to see how it behaves.

This is hard to formalize, since meanings are not really at a sufficiently clear stage of expression. Jackendoff (24) says, 'it seems perfectly adequate to provisionally adopt an arbitrary feature, if we have clear intuitions about when this feature is present, and if it is fully understood that it has no life independent of the complete reading in which it is embedded.'

This will be done in our discussion of modals and NEG-ASSOCIATION verbs below. While (at this level of formalization) it seems no less arbitrary than exception features, it is claimed, at least, that the items so marked are not learned as exceptions to rules, but that their syntactic and semantic behaviors will be readily predictable from their meanings when a truly adequate formulation of meaning is given.

4.2. Modal Structure

4.2.1. In sentence (81) there are two possible readings.

(81) Todd is looking for a groupie.

On one reading, there is a specific groupie Todd is looking for; on the other, he will take any old groupie. In other words, a groupie may be either specific or nonspecific. There is a similar ambiguity in sentences with the following verbs.

(82) look for, want, intend, ask for, hunt for, hope for, etc.

Normally noun phrases are interpreted as specific. In sentences with one of the verbs in (82) in them, certain noun phrases have the option

of being read as nonspecific. Jackendoff uses the following terminology (which I adopt here). A verb in this class may introduce the possibilities of nonspecificity on noun phrases within a certain portion of the sentence. This portion of the sentence is called the scope of the verb (with regard to specificity). Thus, a given noun phrase in a given sentence is in a verb's scope if nonspecificity is a possibility. The NP is within the scope even if it is interpreted as specific. If it is specific, the NP is said to be not dependent on the verb; if the NP is non-specific, it is dependent on the verb. The scope of a verb is invariant through all readings.

The verbs in (82) contain in their lexical entries a modal operator called UNREALIZED. The modal condition on UNREALIZED says that a noun phrase which is dependent on UNREALIZED will have a specific referent only when the unrealized situation comes to happen. For example, in the nonspecific reading (81), there will be a specific groupie to point to only when Todd finds one ((81) would be broken down in functional structure as TRY (TODD, FIND (TODD, GROUPIE))). Each modal operator has its own modal condition.

4.2.2. There needs to be a rule which will determine which noun phrases are dependent on which modal operators. This is the rule (from Jackendoff 1972: 292):

(83) (Modal Projection rule)

Given a lexical item A, whose semantic representation contains a modal operator M, if a NP is within the scope of A, it is optionally (with degree of preference d_M) dependent on M in the modal structure, that is, subject to C_M . If a NP is outside the scope of M, it is not dependent on M.

Several things need to be explained here. The first is the degree of preference d_M . The optionality of the dependence of a noun phrase on a modal operator varies sometimes from modal to modal or from speaker to speaker. The d_M is a fudge factor to handle this variation, in the absence of a more detailed account.

The C_M is the modal condition associated with the modal operator. For the operator UNREALIZED, we saw above that the condition states that a NP dependent on it will have a referent when the unrealized situation comes about. Other modal operators will have different conditions, as we will see.

Some other modal operators, samples of lexical items bearing them and their modal conditions are given below:

- (84) a. FUTURE: will
 b. C_{FUTURE} : a NP is claimed to have a referent sometime in the future
- (85) a. POSSIBLE: possible, likely, may
 b. C_{POSSIBLE} : the existence of a referent is possible (strength varies with lexical item)
- (86) a. NEGATIVE: no, not, never, neither, nothing, doubt, seldom, afraid, too, dissuade, etc.
 b. C_{NEGATIVE} : there is no identifiable referent

- (87) a. MULTIPLE: some, all, each, many, five, three, etc.
 b. C_{MULTIPLE}: there is a distinct referent corresponding to each member of the set being quantified.
 c. Five of the boys told me a story. (not dependent: one story; dependent: five stories)
- (88) a. WH: wh- (questions)
 b. C_{WH}: the identification of a referent depends on the answer to the question.

Notice that some of the operators have a degree of preference that leans towards obligatory application of the modal condition, for example NEGATIVE. In (89) it is hard to get the specific reading for a cigarette.

- (89) Libby couldn't find a cigarette.

But with contrastive stress a specific reading is possible. Compare (90a) and (90b).

- (90) a. I didn't see many of the celebrities there.
 b. I didn't see many of the celebrities there.

For an ambiguous sentence like (81), the two readings will have identical functional structures but will differ in modal structures. Jackendoff uses parentheses to indicate dependence. Hence the two readings of (81) will have modal structures like (91a) and (91b)

- (91) a. UNREALIZED (a groupie) [non-specific]
 b. UNREALIZED () [specific]

I will omit NP's that are not dependent on any modals.

4.2.3. Modals can also affect clauses. For instance:

- (92) a. Todd wants to meet a groupie.
 b. Todd will meet a groupie.
 c. It is possible that Todd will meet a groupie.
 d. Todd doesn't have a wife.
 e. Four of the band members met a groupie.

In each of these sentences, the truth conditions on the clauses in the scope of the modals are also subject to the modal condition. In (92a) Todd meets a groupie is true if the unrealized situation comes about. (92b) claims that Todd meets a groupie will be true in the future. (92c) says that it is possible. (92d) says that the truth conditions for Todd has a wife are not met. (92e) says that there could either have been one meeting or four meetings.

Note that while the modal conditions for NP's are usually optional, the conditions for S's are usually obligatory. (Jackendoff 1972 discusses this (p. 312-314) to an extent. The question is beyond this paper.)

4.2.4. Still to be discussed is the notion of the scope of a modal. The scope of a modal operator is 'that portion of the sentence within which the modal operator' may affect claims about the identifiability of referents' (Jackendoff 1972: 292).

In order for the rule to work, it must have a knowledge of which NP's (and S's) are within the scope of which modals. Jackendoff says this can be determined usually (though not always) from the syntactic structure. He says there are three types of syntactic scope, each predictable from the syntactic properties of the lexical item bearing the modal. For verbs and other items which are capable of strictly subcategorizing NP's or S's (such as adjectives like possible), the scope of the modal operator is one of the NP's subcategorized by the lexical item bearing it. This is called Type I scope. So, the object but not the subject of want will be in the scope of UNREALIZED, for example. For possible, the complement clause will be within the scope of POSSIBLE.

For auxiliary verbs, the scope of the modal (POSSIBLE in the case of may or might, FUTURE in the case of will) is all the material commanded by the modal. For the purpose of allowing S's to be in the scope of the modal, Jackendoff extended the notion of command to include the dominating S node. This is called Type II scope.

For determiners (quantifiers and numbers) plus the particle not, the scope is all the material to the right which is commanded by the lexical item (the dominating S node is to be included in this). This is Type III scope.

Further, the scope for verbs is claimed to be read off the deep structure; for auxiliary verbs and determiners, the scope is determined at surface structure. This is shown by the fact that, for instance, PASSIVE does not affect the scope of verbs since (93) can still have a nonspecific reading (i.e. an expert is still dependent on UNREALIZED), whereas PASSIVE changes the preferably nonspecific many in (94a) to specific.

- (93) An expert is needed by this committee.
- (94) a. The teacher didn't pass many of the students.
b. Many of the students weren't passed by the teacher.

Whereas many was within the scope of NEGATIVE in deep structure, it is outside of it in surface structure. Corresponding to the nonspecific reading in the passive would be (95).

- (95) Not many of the students were passed by the teacher.

The best way to avoid this scope-changing is to read the scope for negatives and quantifiers from the surface structure. Jackendoff gives more examples to show that it is not just PASSIVE that affects this change. Keeping the order of the operators stright requires a global constraint in Generative Semantics, so it can't be stated as constraints on individual transformations.

In Jackendoff (1975a), a new modal operator IMAGE is introduced. This operator is present in those lexical items which have to do with images like painting, picture, image and in verbs of mental-image like believe, think, suppose, etc. A NP is within the scope of IMAGE if its location is within an image-containing object. Location refers to the thematic relations mentioned earlier. To illustrate, consider (96a) and (96b):

- (96) a. Unicorns exist only in Africa. [non-image]
 b. Unicorns exist only in pictures. [image]

In both these sentences locations are expressed for unicorns. But whereas in (96a) they are real unicorns, in (96b) the location is in an image-containing object, so unicorns is dependent on IMAGE. The modal condition for IMAGE says that the referent is an image. In most cases pragmatic conditions will force the NP in IMAGE's scope to be dependent on it since, for example, real unicorns cannot exist in pictures. In a case like (97), some red paint might not be dependent on IMAGE since real red paint can exist in a picture.

- (97) In that picture, there is some red paint.

If some red paint is dependent on IMAGE, then we are talking about a picture of some red paint. But usually, NP's must be dependent on IMAGE if they are within the scope. Also S's are very likely to be dependent on IMAGE due to pragmatic conditions; hence in (98a) and (98b), there may be real-red paint on the image-arm so red paint and the whole S would not be dependent on IMAGE, but a real cast cannot be located in a painting so everything must be dependent on IMAGE in (98b).

- (98) a. In that painting there is red paint on Frank's arm.
 b. In that painting there is a cast on Frank's arm.

The important thing to note is that even though the scope of IMAGE is semantically determined (which weakens the theory, since all the others are syntactically determined), it is still a relatively easy matter to decide whether a NP or a S is within the scope of the modal. In particular, in the case of the believe class of verbs, since they strictly subcategorize their complement Ss, the scope is determined at the level of deep structure.

4.2.5. There appear to be interactions between the various parts of the semantic representation. This is to be expected. I would like to discuss one such interaction which affects the modal NEGATIVE, among others. Consider the following:

- (99) a. Howard didn't kill an ant.
 b. Howard didn't see Alex kill an ant.

In (99a), there is a strong preference for reading an ant as non-specific (i.e. dependent on NEGATIVE) and the sentence Howard killed an ant is almost obligatorily dependent on NEGATIVE. But consider (99b). The main clause Howard saw... is obligatorily dependent on the modal, but this is not so for the complement clause. There is a reading, which is not too hard to get, in which Alex killed an ant but Howard didn't see it. In this case, an ant must also be not dependent on the modal: since if Alex did kill an ant, it must be a specific ant.

It is important to see that the negative sometimes only makes a claim about the clause where it is syntactically located. (99b) definitely says that there was no act of seeing Alex kill an ant taking

place, but it really doesn't say anything one way or the other about whether an act of killing took place.

The particular verb which intervenes can determine what the changes are that the subordinate clause will be dependent on NEGATIVE. For instance, factive verbs like realize or regret tend to be strong blocks against dependence.

- (100) a. I didn't realize that Richard married a Yugoslavian.
b. I don't regret that the people elected a woman.

In both of these cases, the embedded clauses and the indefinite NPs are almost obligatorily read as not dependent on NEGATIVE (i.e., the NP is specific).

On the other hand, an implicative verb, when negated, implies the negation of its complement, so it represents no block to dependence at all, as seen in (101).

- (101) a. I didn't manage to win a prize.
b. Harry didn't happen to meet a hooker.

In these sentences, the complements are negative and the NPs are non-specific.

Some of the cases in between are harder to decide. The particular class that is of interest here are the verbs containing the modal IMAGE (henceforth IMAGE-verbs). In a sentence like (102) it is claimed that an image of John killing a man doesn't exist.

- (102) I didn't say that John killed a man.

There certainly is the possibility of a man and kill being not dependent on NEGATIVE. This is as opposed to (102) where kill and a man are definitely dependent on NEGATIVE.

- (103) I said that John didn't kill a man.

The IMAGE-verb blocks the obligatory dependence on NEGATIVE in (102)

Note that any and some items of weaker negative polarity like lift a finger seemingly may appear in the scope of a negative, without actually being dependent on the NEGATIVE modal, unlike until.

- (104) a. I didn't realize that Harry had killed anyone.
b. Harry didn't kill anyone.

In (104b), for any referent you pick, you may claim that Harry didn't kill him. No such claim can be made in (104a). Hence anyone appears to not be dependent on NEGATIVE in (104a). It is within the scope of the not, however, so anyone is possible. Until in a similar position would be ungrammatical.

This appears to be a problem for Jackendoff, who claims (1972, section 8.3) that any must be dependent on the NEGATIVE to appear. This seems intuitively correct to me, but then (104a) is unexplained. Perhaps when this blocking phenomenon is better understood, the problem can be cleared up.

This blocking is important because I claim that until, the tag question interpretation rule, and the VP-Anaphora rules require a sentence's absolute dependence on NEGATIVE to qualify as being negated, as will be seen in section 5.

It might also be noted here that blocking occurs with other modals of Type II and Type III scope. For instance,

- (105) a. Seven people think John ate an apple. [MULTIPLE]
 b. Jerry might believe that Richard erased a tape.
 [POSSIBLE]
 c. Jeb will say that Richard promised him a sum of
 money. [FUTURE]

In each of these cases, there are clear readings where the final NP is specific and where the embedded sentences are definitely not dependent on the modals, yet, if the verb is right, the embedded sentence will be dependent on the modal:

- (106) a. Seven people will manage to get a high grade.
 b. Jerry might happen to show up at the OSU-Michigan
 game.
 c. Sherry will remember to feed the cat.

If the sentence is expressive, this blocking will not occur. In the case of expressive sentences with a main clause NEGATIVE, NEG-ASSOCIATION will apply and the complement sentence will be dependent on NEGATIVE. MULTIPLE, POSSIBLE and FUTURE cannot appear in the main clause of expressive sentences (recall section 3.2.4), so blocking will always be possible in those cases, although it will not always occur.

I don't really know how to explain when or how specific IMAGE-verbs used reportively will block dependence of the lower clause on NEGATIVE. For now, we can note that it does occur and it will be indicated simply by the removal of items from among NEGATIVE's dependents in a sentence.

4.2.6. One additional point might be briefly made. Jackendoff suggests that the modal structure is where the illocutionary force of a sentence might be indicated. His discussion of the WH modal in questions provides some interesting descriptions and a logical next step might be to include imperatives, declaratives, performatives and so on, all in the modal structure somehow. For instance, just as an artichoke is non-specific in a WH question, it is non-specific in an imperative, cf. (107).

- (107) a. Who ate an artichoke?
 b. Eat an artichoke.

Much more research needs to be done on this matter, obviously.

I mention this matter here because the illocutionary force of the sentence is an important factor, as we have seen, in the NEG-ASSOCIATION process and it would be nice to be able to include the relevant information on illocutionary force (however that is done) into a part of the machinery which already has independent evidence for its existence.

4.3. Formulation of the NEG-ASSOCIATION rule

4.3.1. We are now ready to attempt one formulation of a semantic interpretation rule to replace NEG-RAISING. Before I attempt to do that I must repeat the disclaimer raised in section 3.3, namely that I am unable to specify formally what the conditions are which allow the rule to operate. Obviously, there is a restriction in terms of which specific predicates can undergo the rule, but there also must be an expressive force to the sentence. This expressive force may eventually find its description in the modal structure, as suggested in section 4.2.6, but I cannot do it within the limits of this paper. For the purposes of formulating the rule, I will refer to the notion of a NEG-ASSOCIATION verb: a verb (or a predicate like likely) which allows NEG-ASSOCIATION. This characteristic is to be indicated in the lexical entry, eventually as part of the semantic content, but for now as an arbitrary-looking feature (recall the lack of significance of this fudge, as mentioned in section 4.1.3.). I will not discuss the nature of these verbs or the nature of the expressiveness any further, but will assume that both must be present for the rule to operate.

4.3.2. As a first approximation, we might suggest that NEG-ASSOCIATION replaces the items dependent on NEGATIVE (call them its dependents). The modal structure of (108) without NEG-ASSOCIATION is (109).

(108) I don't think Ellen ate the pretzels.

(109) NEGATIVE (think), ate IMAGE (Ellen, ate, the pretzels).

Now, suppose we were to say that NEG-ASSOCIATION replaces the dependents of NEGATIVE with those of IMAGE. This would give (110).

(110) NEGATIVE (Ellen, ate, the pretzels) IMAGE (Ellen, ate, the pretzels)

But this is not the correct modal dependence structure for the sentence. In particular, it says that Ellen and the pretzels are dependent on NEGATIVE, which would claim that there are no referents for them. But definite NPs cannot be dependent on modals (except IMAGE) since they are already specific.⁹ This is a pragmatic conflict, and the sentence with a definite NP dependent on NEGATIVE should be rejected. Therefore NEG-ASSOCIATION must work some other way.

4.3.2. A better idea seems to be that NEG-ASSOCIATION removes material from dependence on NEGATIVE. However, there are still several alternatives. For instance, since the sentence (111) is the sentence that (108) is synonymous with, if NEG-ASSOCIATION applies we might suggest that the modal structure be changed from (109) to (112), with the embedded subject considered to be to the left of the not (i.e. not dependent on it).

(111) I think that Ellen didn't eat the pretzels.

(112) NEGATIVE (ate) IMAGE (Ellen, ate, the pretzels).

In other words, by this formulation, NEG ASSOCIATION would remove from dependence on NEGATIVE all elements preceding the IMAGE verb. However,

there are examples which show that this rule would produce the wrong results.

Consider (113a), with a modal structure of (113b).

- (113) a. I don't think that many people saw Rhoda tonight.
 b. NEGATIVE (think, many, saw), IMAGE (many people, saw, Rhoda), MULTIPLE (people, saw).

If NEG-ASSOCIATION applies as we have formulated it, the modal structure will be (114b), which corresponds to the sentence (114a).

- (114) a. I think that many people didn't see Rhoda tonight.
 b. NEGATIVE (saw), IMAGE (many people, saw, Rhoda), MULTIPLE (people, saw).

But (114a) and (113a) are not synonymous. (113a) is synonymous with (115a), which has the modal structure (115b).

- (115) a. I think that not many people saw Rhoda tonight.
 b. NEGATIVE (many, saw), IMAGE (many people, saw, Rhoda), MULTIPLE (people, saw).

This suggests that the subject of the embedded clause is still dependent on NEGATIVE after NEG-ASSOCIATION. This would mean that an indefinite subject would be read as nonspecific.

- (116) I don't believe that a man is coming.

If (116) is read so that NEG-ASSOCIATION has applied, a man will have no referent (i.e., it will be nonspecific, dependent on NEGATIVE). If it is read so that a man has a specific referent, then the sentence is reportive and NEG-ASSOCIATION has not taken place. This is what the formulation of NEG-ASSOCIATION should predict. If the rule doesn't apply, the IMAGE-verb blocks the dependence of the lower sentences on NEGATIVE, just as if the verb were not a NEG-ASSOCIATION verb.

The formalization of the rule is this:

- (117) NEG-ASSOCIATION (obligatory)
 Given a modal structure as follows: NEGATIVE ($X_1, X_2, \dots, A, Y_1, Y_2, \dots$), $A(W_1, W_2, \dots)$, $M_1(N_1, N_2, \dots)$, $M_2(\dots)$, ... where A is a NEG-ASSOCIATION verb, where Y_1, Y_2, \dots may equal W_1, W_2, \dots and where the sentence is expressive, change the modal structure to:
 NEGATIVE (Y_1, Y_2, \dots), $A(W_1, W_2, \dots)$, $M_1(N_1, N_2, \dots)$, ...

4.3.4. Notice that the rule as stated now is obligatory. If the rule does not apply, then the sentence is not expressive. Conversely if a sentence which meets the structural description of the rule, like (116) for instance, is claimed to be expressive then NEG-ASSOCIATION must have taken place. Let's look again at the passives in section 3.2.5.

Remember that a passive sentence like (118b) is not ambiguous like its active counterpart (117a).

- (118) a. Joel doesn't believe that Hildy is coming.
 b. That Hildy is coming is not believed by Joel.

The modal structures of these sentences before NEG-ASSOCIATION are (119a) and (119b), respectively.

- (119) a. NEGATIVE (believe, coming), IMAGE (Hildy, coming)
 b. NEGATIVE (believe), IMAGE (Hildy, coming)

As we mentioned in section 3.2.5, (118b) is not expressive, so NEG-ASSOCIATION is not allowed and (118b) will be unambiguous. The difference in modal structure is due to the fact that NEGATIVE's dependent are determined at the surface structure (because not has Type III scope) and IMAGE's are determined at deep structure. PASSIVE removes the complement sentence from dependence on NEGATIVE, but not from dependence on IMAGE. The fact that the complement in (118b) is not dependent on NEGATIVE may lead strength to the idea that it is presupposed.

If EXTRAPOSITION applies to (118b), we get (120), which also has the modal structure (119a).

- (120) It is not believed by Joel and Hildy is coming.

NEG-ASSOCIATION is possible here, and, as expected, (120) is ambiguous. Further, RAISING may now apply to give (121), and its modal structure is again (119a).

- (121) Hildy is not believed by Joel to be coming.

In these cases, when NEG-ASSOCIATION applies the resulting scope will be (122).

- (122) NEGATIVE (coming), IMAGE (Hildy, coming)

Notice that by this account, PASSIVE and RAISING can change meaning, since PASSIVE puts Joel into the scope of not, and RAISING removes Hildy from not's scope. If either of these two NP's had been indefinite, a meaning change could result.

- (123) a. A man doesn't think I'm coming.
 b. ?That I'm coming is not thought by a man.

In (123a), a man is specific, but in (123b) it is preferably non-specific. Also compare (124a) and (124b):

- (124) a. It is not thought by Joel that a girl is coming today.
 b. A girl is not thought by Joel to be coming today.
 c. ??It is thought by Joel that not a girl is coming today.
 d. It is thought by Joel that a girl is not coming today.

In (124b) a girl is preferably specific, whereas this is the weaker reading in (124a). This changing of meaning does not affect the ambiguity possibilities of the sentence, once you remember that the result of NEG-ASSOCIATION on (124a) gives a sentence like (124c) and not (124d).

4.3.5. The NEG-ASSOCIATION rule also says that if there is anything between not and the NEG-ASSOCIATION verb, it is excluded from dependence on NEGATIVE after the rule applies. In (125), NEG-ASSOCIATION must be applying.

(125) Scarcely anybody thinks she is not coming until tomorrow.

since until is acceptable. A paraphrase for scarcely anybody here would be almost not anybody, with an overt negative with anybody in its scope. After NEG-ASSOCIATION applies, the paraphrase of (125) would be (126).

(126) Almost anybody thinks she is not coming until tomorrow.

In this case, anybody is read as a universal quantifier, which is the correct reading for the sentence. Jackendoff (1972: section 8.3), following Vendler (1967), says that any presents the hearer with a choice of referent. In a sentence like (127a) the claim is made that whatever thing you choose, John didn't see it.

- (127) a. John didn't see anything.
b. Anybody can add two and two.

In (127b), whatever person you choose, they can add two and two. Thus, each meaning of any is captured by this account. The correct meanings for (125) and (126) can be generated with NEG-ASSOCIATION and Vendler's characterization of any, which Jackendoff (1972: 339) says has no equivalent in the predicate calculus.

4.4. Summary.

This has been a brief explication of the general framework I am using and of the alternative to a NEG-RAISING transformation, the semantic interpretation rule of NEG-ASSOCIATION. In the next section, this framework and this rule will be tested on the data given in section 1, to see if it can correctly provide an explanation for the data that NEG-RAISING was created to explain.

5. Another Look at the Data.

In this section, I would like to show how the semantic interpretation rule of NEG-ASSOCIATION interacts with the rest of the interpretive rules to construct semantic representations for sentences. In particular, I would like to consider the data given in section 2 as evidence for the syntactic transformation, to see how they may be taken into account in the interpretive framework.

5.1. until

5.1.1. The lexical expression until, along with the idiomatic lift a finger, in years and other negative polarity items have a selectional restriction on them which requires a negative¹⁰ in the same sentence with them. Since selectional restrictions are considered to be semantic in nature, in a Generative Semantics framework, this requires the NEG to be a clause-mate of the until in the deep (i.e. semantic) structure of the sentence. In an Interpretive Semantics framework, the selectional restrictions, as well-formedness conditions on semantic interpretations, are not checked until the complete semantic representation is formed. In this case, it will be after the NEG-ASSOCIATION rule has operated.

Consider the following examples, repeated from section 2.1.1.

- (128) a. *I think the trial will finish until next month.
 b. I don't think the trial will finish until next month.
 c. I think the trial won't finish until next month.

To form the modal structure the modal projection rule will be applied to each of the modal-carrying words, think, will and not. The NPs the trial and next month are both definite, so they cannot be dependent on FUTURE, although they can be dependent on IMAGE, and the embedded sentence will be dependent on IMAGE and FUTURE; thus, (129) is the modal structure of (128a).

- (129) IMAGE (the trial, finish, next month), FUTURE
 (finish)

The selectional restriction on until will be considered to be satisfied if the sentence containing until is obligatorily dependent on NEGATIVE. Since this is not the case in (129), the selectional restriction is violated and (128a) is bad.

For (128b), the same things will be dependent on FUTURE and IMAGE. Under the reportive reading where no NEG-ASSOCIATION applies, the IMAGE verb blocks the lower sentence from definitely being dependent on NEGATIVE, so the entire modal structure for (128b) will be (130).

- (130) IMAGE (the trial, finish, next month), FUTURE
 (finish), NEGATIVE (think).

Reportively, (128b) is the negation of (128a), so the selectional restriction is not met and the sentence is again out. If the main verb in (128b) were a non-NEG-ASSOCIATION verb, this would be the only choice, but for think we can apply NEG-ASSOCIATION to (128b) to get (128c). The modal structure is based on (128c) is (131).

- (131) IMAGE (the trial, finish, next month) FUTURE
 (finish) NEGATIVE (finish)

In this reading of (128b), the embedded sentence is dependent on NEGATIVE, so the selectional restriction is satisfied and (128b) has a good reading. Notice that (128c), which is synonymous with the

good reading of (128b), also has the modal structure (131).

5.1.2. Consider next the sentences with the 'inherently negative constituents' which inspired Klima to suggest NEG-ABSORPTION. They are repeated here.

- (132) a. She is too weak to have another child until 1978.
 b. Bill is afraid to leave until his mother comes.
 c. I doubt he will arrive until next month.
 d. My diet forbids me to eat until mealtime.
 e. Scarcely anybody expected him to resign until next year.

Of these (132c) and (132d), with the NEGATIVE modal contained in a verb, are easier to handle. The scope of a modal contained in a verb is determined at deep structure and it consists of one of the NP's subcategorized by the verb. In these two cases, the complement sentence is in the scope of the modal. The deep structures will be something like (133a)-(133b).

- (133) a. I doubt [he will arrive until next week].
 b. My diet forbids [I eat until mealtime].¹¹

and the modal structures will be, respectively.

- (134) a. NEGATIVE (arrive) FUTURE (arrive)
 b. NEGATIVE (eat)

Since the NPs are definite, they will not be dependent on NEGATIVE. From these dependence relationships, we can see that the embedded sentences are dependent on NEGATIVE, and the selectional restrictions on until are satisfied.

For (132a) and (132b), even though too and afraid are not verbs, they do strictly subcategorize a complement clause, and so the complement clauses will be within the scope of the modal. Indefinite noun phrases in the complement clause may be not dependent on NEGATIVE, as in (135a) and (135b),

- (135) a. Sally is too shy to go out with a friend.
 b. Bill is afraid to propose to an actress.

where the NPs a friend and an actress have possible specific readings (i.e. not dependent on NEGATIVE), but the complement sentences themselves are still dependent (i.e. Sally is not going out and Bill is not proposing). The modal structures for (132a) and (132b) are in (136):

- (136) a. NEGATIVE (have)
 b. NEGATIVE (leave)

These modal structures also satisfy the selectional restriction on until.

Sentence (132e) has a NEGATIVE in scarcely. This undergoes NEG-ASSOCIATION to place the embedded sentence dependent on NEGATIVE, to satisfy until.

Some people think a similar sentence with a non-NEG-ASSOCIATION verb is grammatical. See section 5.1.4. for a discussion of these type of sentences.

5.1.3. The alternative to NEG-ABSORPTION was lexical decomposition of the inherently negative constituents into parts which contained an overt negative. Since this is not allowed in a strictly lexicalist grammar, it would be nice to be able to explain the data without resorting to it. The original sentences in (132) have already been taken care of without the aid of lexical decomposition.

Next consider (137a) and (137b), the sentences which lexical decomposition could not forbid.

- (137) a. *I don't doubt she will come until tomorrow.
b. *Bill isn't afraid to leave until his mother comes.

In the present system, the verbs come and leave (i.e. their sentences) will be dependent on two NEGATIVES each, one coming from the not, the other from doubt or afraid.¹² The two negatives cancel each other out¹³ and the embedded sentence gets a reading which is dependent on no negatives, and so the selectional restriction is violated.

Sentences similar to (137), but without until, will have perfectly acceptable readings, as will the sentences in (138) which gave NEG-ABSORPTION the problem of having to generate two negatives in the lower auxiliary.

- (138) a. Bill is afraid not to leave.
b. Ali is too clever not to win.

5.1.4. Lindholm (1969) mentions some very puzzling sentences which are grammatical for some speakers.

- (139) a. I didn't realize that I had to do it until tomorrow.
b. I realized that I didn't have to do it until tomorrow.
(140) a. I didn't claim that I would finish the paper until Friday.
b. I claimed that I wouldn't finish the paper until Friday.
(141) a. It isn't clear that he'll leave until next week.
b. It is clear that he won't leave until next week.
(142) a. I can't believe that he would take the test until he's ready.
b. I can believe that he wouldn't take the test until he's ready.

The (a) sentences are not paraphrases of the (b) sentences, to this cannot be NEG-RAISING/NEG-ASSOCIATION in operation. In particular, how can the (a) sentences satisfy the selectional restrictions on

until) (Also in this category are some sentences mentioned in section 5.1.2, like Scarcely anybody says he will come until tomorrow.)

A possible solution in this framework would be this: In these sentences, the not definitely includes the complement sentences in its scope. I have claimed, however, in section 4.2.6 that the presence of certain verbs (realize, claim, clear, can't believe all qualify as members of this set) would sometimes block the embedded sentence from dependence on NEGATIVE. These sentences would seem to be cases where the dependence is not blocked. There must be some cases where the complement is dependent on NEGATIVE, as we have seen (cf. (131), so (139)-(142) are not entirely unexpected. Notice that all of the complement sentences are dependent on FUTURE also. This may be a factor, especially where the tenses of the sentences are considered. In particular, (139a) gets a different meaning if tomorrow is replaced by yesterday, where the until phrase modifies I don't realize. I cannot go into all the problems these sentences present, but they may find some partial explanation here as relaxations of the blocking, for whatever reason.

5.1.5. To sum up the results of this section, all of the examples from section 2.1 have been accounted for without the use of the transformations NEG-RAISING, NEG-ABSORPTION and without lexical decomposition.

5.2. Tag questions

5.2.1. The transformational account of tag-questions is based on the rule first developed in Klima (1964). The tag consists of the first part of the auxiliary (do appears if there is only a tense marker in the auxiliary) and a pronominal copy of the subject from the main sentence. In addition, the tag has opposite polarity from the main sentence with respect to negativity.

This rule generates only 'normal' tags. If the tag is considered to be sarcastic or otherwise different from the normal meaning of a tag question, a matching polarity tag may appear.

In an interpretive framework, either a positive tag or a negative tag may appear, and the matching or non-matching of polarities will affect the meaning and/or the illocutionary force of the sentence. The intonation of the tag (rising or falling) will also have to be taken into account for the entire reading.

5.2.2. With respect to the data, the two approaches seem equally capable of explaining what is happening. There will have to be some principles, presumably relating to illocutionary force, that describe the conditions under which the complement clause may be the basis for the tag (see section 3.2.4.). The crucial sentence (repeated from section 2) is (143),

(143) I don't suppose the Phillies will win, will they?

which R. Lakoff accounted for with her (cyclic) NEG-RAISING, but it can be just as easily explained by the use of NEG-ASSOCIATION. If NEG-ASSOCIATION were not operating (i.e. the main sentence is reportive),

the modal projection rule would operate to give the modal structure (144).

- (144) a. NEGATIVE (suppose) IMAGE (the Phillies, win)
FUTURE (win)
b. NEGATIVE (win) IMAGE (the Phillies, win) FUTURE
(win)

In this case the complement sentence would be blocked from dependence in negation by the IMAGE-containing verb suppose used reportively. Thus the complement sentence would be positive, and a positive tag should produce a different meaning for the sentence. This is what would happen if suppose in (143) were replaced by say or claim or some other non-NEG-ASSOCIATION verb.

However, the fact that the tag is formed on the complement means that (143) must be expressive. Therefore NEG-ASSOCIATION must apply if it can. But, for NEG-ASSOCIATION verbs like suppose, NEG-ASSOCIATION will apply giving (144b). The complement sentence cannot be blocked from dependence on NEGATIVE because the sentence is expressive. The complement sentence is negated, so a positive tag will give the desired reading, which is the same as (145) (which also has the modal structure (144b)).

- (145) I suppose the Phillies won't win, will they?

The sentences in (146)

- (146) a. I don't think they'll win, will they?
b. I don't believe they'll win, will they?

which by NEG-RAISING would have come from the bad (147a) and (147b)

- (147) a. *I think they won't win, will they?
b. ?*I believe they won't win, will they?

were problems in the Generative Semantics framework and remain so here. The fact that (146a) and (146b) are bad would suggest that think and believe are not being used expressively in these sentences. It is not clear to me whether this is so. Perhaps, as the semantic and/or illocutionary conditions for the occurrence of embedded sentence tags become worked out, the problem may receive an answer which would be compatible with either the Generative or Interpretive approach.

5.3. Parentheticals

5.3.1. The Generative Semantics treatment of parentheticals, as described in section 2.3, was provided by Ross (1973). In that paper Ross mentions some of the problems his solution can't handle. For instance, there is no explanation of why most verbs cannot appear as negative parentheticals, since presumably the lifted S could appear as a complement under many negated verbs. The example (148a) may not undergo SLIFTING to give (148b), even if negation is present in the lower sentence.

- (148) a. I don't claim Wallace will be elected.
 b. *Wallace will (not) be elected, I don't claim.

The one neat result (relevant to this discussion) that Ross gets is an explanation of why the NEG-RAISING verbs can appear as negative parentheticals and only with negated complements. In this case, the source of (149) must be (150a), and not (150b), in underlying structure.

- (149) This guy is not corrupt, I don't think.
 (150) a. I think this guy is not corrupt.
 b. I don't think this guy is corrupt.

The NEG in (150b) is copied, the embedded sentence undergoes SLIFTING, and the original NEG is deleted, giving (149). If the NEG originates in the upper sentence, then the verb could be presume, insist, confess or many others, and SLIFTING would produce a sentence like (149). Since these other verbs are all bad in this case, saying that the NEG originates in the lower sentence says that only the NEG-RAISING verbs will be able to appear. But this still doesn't explain why (150b) should be bad as a source for (149).

5.3.2. Jackendoff (1972: section 3.1.2) treats parentheticals like sentence adverbs. He generates them directly where they appear on the surface—as opposed to Ross, who uses SLIFTING to put the parentheticals at the end and a rule called NICHING (which also applies to sentence adverbs) to move the parenthetical to where it appears. While I don't want to compare the two overall systems, I would like to demonstrate that via NEG-ASSOCIATION, it can be explained how it is possible for the verbs which may undergo that rule to appear as negative parentheticals.

The semantic interpretation for parentheticals is by his projection rule P_{SPEAKER} for speaker-oriented adverbs, which embeds the sentence as an argument in the function generated in the semantic representation of the adverb. For example, in (151) the functional structure PREFER (the voters, Rhodes) becomes the argument in the function EVIDENT (X) giving the functional structure (152).

- (151) Evidently, the voters prefer Rhodes.
 (152) EVIDENT (PREFER (THE VOTERS, RHODES))

A parenthetical can also be considered as a one-place predicate, for example, THINK (I,X). So (153a) gets the functional structure (153b) by inserting the reading of the main sentence as the argument in the parenthetical:

- (153) a. The voters prefer Rhodes, I think.
 b. THINK (I, PREFER (THE VOTERS, RHODES))

Notice that (153b) has the same functional structure as would be generated for (154).

- (154) I think the voters prefer Rhodes.

So even though (153a) and (154) were generated syntactically in different ways, they receive identical functional structures.

Notice, however, that the difference in syntactic generation results in a different modal structure; in (153a) the sentence the voters prefer Rhodes is outside the scope of think, so it cannot be dependent on IMAGE. This is shown by the lack of an opaque reading in (155). Only the contradictory transparent reading exists.

(155) *The voters prefer Rhodes, he thinks, but they don't.

Thus, for the sentences (156a) and (156b) the modal structures will be (157a) and (157b).

- (156) a. The voters don't like Gilligan, I don't think.
 b. I don't think the voters like Gilligan.
 (157) a. NEGATIVE (like), NEGATIVE (think), IMAGE ()
 b. NEGATIVE (think, like), IMAGE (the voters, like, Gilligan)

If NEG-ASSOCIATION applies to (157a), the modal structure is (158).

(158) NEGATIVE (like), NEGATIVE () think ()

This is the same as the modal structure for (159).

(159) The voters don't like Gilligan, I think.

If the verb was not a NEG-ASSOCIATION verb, we would have no way of eliminating the extra negative from the semantic representation of (156a). But by NEG-ASSOCIATION we can explain why (159) and (156a) are synonymous.

This account also explains the fact that the negative parentheticals which do occur never have the power to negate the main sentence by themselves. What is unexplained is why a sentence like (160) could not exist where the negative in the parenthetical would remain, since there is no NEG-ASSOCIATION verb present.

(160) *The voters prefer Gilligan, I don't presume.

So while a complete explanation of parentheticals is still far away, the interpretive theory can account for the same things the NEG-COPYING plus NEG-DELETION scheme can, without the troubles that analysis entails.

5.4. The late rules

5.4.1. In an Interpretive Semantics framework, no transformation may refer to the purely semantic notion of coreference. Therefore all rules which are deletion under identity are disallowed. This includes the rules of SENTENCE-PRONOMINALIZATION, SLUICING, and VP DELETION. The interpretive grammar would have anaphora or empty nodes (symbolized by Δ) generated in the deep structure, i.e. lexical insertion on a node is optional. If any empty node remains uninterpreted at the end of the derivation, the sentence is rejected as ill-formed. Rules

of VP-Anaphora interpretation (cf. Jackendoff 1972: ch. 6) would fill in the semantic reading for the empty nodes or the anaphora it, do so and so on. Providing details of the exact forms of the rules would be too lengthy for this paper. For the purposes of this discussion, I will assume that there are rules that can be worked out along the lines Akmajian (1970) and Jackendoff suggest. In any event, it will be seen that the rule of NEG-ASSOCIATION must precede the rules for VP-Anaphora.

5.4.2. Compare (161a) and (161b) (sentence (161a) is from setion 2.4.1):

- (161) a. I don't think John loves Marsha anymore, but
 she doesn't realize it yet.
 b. I don't claim John loves Marsha, but she
 believes it.

In (161a) it clearly refers to John doesn't love Marsha anymore but the it in (161b) cannot mean this, but only John loves Marsha. This must be explained.

I would claim that the verb claim blocks the lower sentence from dependence on the modal NEGATIVE (as discussed in section 4.2.6) so that the modal structure can only be (162).

- (162) NEGATIVE (claim, anyone), IMAGE (John, Marsha,
 love)

In other words John loves Marsha is not dependent on NEGATIVE, so the VP-Anaphora rule would not interpret a negative in the reading of it.

In developing the modal structure for (161a), think would also block the dependence of the lower sentence on NEGATIVE if there were no NEG-ASSOCIATION (i.e. if the sentence were reportive). But if NEG-ASSOCIATION applies to (163) then there is nothing to block the complement sentence from being dependent on NEGATIVE.

- (163) NEGATIVE (think, love, anymore), IMAGE (John, love,
 Marsha) NEG (realize)

The modal structure is (164) which has love dependent on NEGATIVE, as we want for the interpretation of it by the VP-Anaphora rule.

- (164) NEGATIVE (love, anymore), IMAGE (John, love,
 Marsha), NEGATIVE (realize)

The second conjunct in functional structure will be, before and after VP-Anaphora:

- (165) a. REALIZE (SHE, IT)
 b. REALIZE (SHE, LOVE (JOHN, MARSHA))

The modal structure will change from empty to (166).

(166) NEGATIVE (realize)

The conference table will also be correctly filled in by the operation of the rule. The VP-Anaphora rule copies all parts of the semantic representation from the first conjunct to the second.

5.4.3. Next consider (167), repeated from section 2.

(167) He's coming and I can guess why.

The functional structure of the second conjunct will be roughly (168) before the VP-Anaphora rule, and after the rule applies, it will be (169)

(168) CAN (I, GUESS (I, WHY(Δ)))

(169) CAN (I, GUESS (I, WHY (COME (HE))))

This is how the rule works as the counterpart of SLUICING. Perhaps WHY will be broken down further in the functional structure, but there will still be an argument open, into which the functional structure of the referent of the empty nodes will be inserted.

For (170), the before and after functional structures in the second conjunct are also (168) and (169),

(170) He's not coming and I can guess why.

but in addition, the VP-Anaphora rule will create the entry in the modal structure for the second conjunct (171) which corresponds to the modal dependence in the first conjunct.

(171) NEGATIVE (come)

Sentence (172), will also have a similar functional structure change,

(172) He's not coming and I can guess why not.

but instead of starting with an empty second conjunct modal structure, there will be a NEGATIVE (Δ) which is filled in by the operation of the VP-Anaphora rule. Sentence (173)

(173) *He's coming and I can guess why not.

will never have the Δ replaced in the modal structure, because there is nothing dependent on NEGATIVE in the first conjunct for the VP-Anaphora rule to copy. The Δ will be uninterpreted at the end of the derivation and the sentence will be rejected as having an incomplete modal structure, just as elements which have uninterpreted empty nodes in functional structure are disqualified.

The crucial example in section 2.4.2, repeated here as (174a), can be compared with a similar sentence with claim, (174b),

- (174) a. I don't think he's coming and I can guess why not.
b. ?I don't claim he's coming and I can guess why not.

Reportive claim would block the sentence he's coming from being dependent on NEGATIVE for (174b),

but NEG-ASSOCIATION may apply on (174a) to remove think from the scope of not. Hence the why not may refer to he's not coming in (174a) but not in (174b) and the application of the VP-Anaphora rule will be similar to that discussed above for (172). This assumes, as mentioned in 3.2.4, that VP-Anaphora rules may refer to an embedded clause only in expressive cases. If NEG-ASSOCIATION does not apply, then (174a) and (174b) have similar readings. There is a possibility of reading the why not as why I don't claim... which accounts for the somewhat awkward sentence (174b).

The important thing to remember is that NEG-ASSOCIATION precedes VP-Anaphora.

5.4.4. The problem of neither-tags is discussed quite thoroughly in Jackendoff (1972: sec. 8.7). Basically the approach is the one I used in the previous two sections. The VP-Anaphora rule, which is obviously at work here, must carry over all parts of the semantic interpretation, including the modal structure. In the case of neither, the two conjuncts must not only be identical, but must be dependent on NEGATIVE. Thus (175) is out

(175) The Phillies will win and neither will the Mets.

because the modal structure for the second conjunct contains NEGATIVE (Δ), which doesn't get altered by the VP-Anaphora rule; the Δ remains uninterpreted and the sentence is rejected.

Notice the difference between (176a) and (176b).

- (176) a. I don't think the Phillies will win and neither will the Mets.
b. *I don't claim the Phillies will win and neither will the Mets.

In the reportive case (176b), the lower sentence may not be dependent on NEGATIVE, because of the IMAGE-verb blocking it. But with NEG-ASSOCIATION in the expressive (176a), the think is removed from the scope of not, and VP-Anaphora can work to give a correct interpretation of the second conjunct. In (176b) the neither requires a parallel negative in the first conjunct, which, since NEG-ASSOCIATION is not allowed, must be in I don't claim... The lack of parallelism in the auxiliaries results in a bad sentence. The good version would be (177).

(177) I don't claim the Phillies will win and neither do the Mets.

Once again, NEG-ASSOCIATION must precede the VP-Anaphora rule.

5.5. care and even

5.5.1. Horn (1971) uses the existence of the NEG-RAISING rule to distinguish between the lexical items bother and care. He claims that both of these verbs are negative polarity items, ¹³ as shown in (178).

- (178) a. I don't care to watch.
 b. *I care to watch.
 c. Sly didn't bother to show up.
 d. *Sly bothered to show up.

He then claims that, while bother doesn't undergo NEG-RAISING because it is an implicative verb (cf. Karttunen 1971), care can undergo NEG-RAISING, as in a sentence like (178a), where the negative semantically is associated with watch.

There are problems with this analysis of care. First of all, if (178a) is derived by the optional rule of NEG-RAISING, then its source, (179), should also be grammatical, which it isn't.

- (179) *I care not to watch.

Horn suggests that possibly wish or want is present in deep structure and if NEG-RAISING occurs, a care-insertion rule takes place optionally. But this proposal has some serious difficulties, which Horn (125) readily admits. For instance, care is considered to be an implicative verb by some, and an 'inference inviter' by others. Thus (180a) strictly implies (180b) for some, while for others there is a strongly invited inference

- (180) a. Harry didn't care to eat dinner.
 b. Harry didn't eat dinner.

that (180b) is true. This could not happen with wish or want.

Alternatively, we could claim that NEG-RAISING is obligatory for care. This would not be sufficient, however. The negative incorporation into indefinites must be blocked if it removes the negative from care.

- (181) a. I don't want (wish, care) to see anybody today.
 b. I want (with, *care) to see nobody today.

Thus, the negative polarity must not only block rules which move a negative from care, but must force rules that move the negative to a position commanding care (in this case NEG-RAISING). This is a highly suspicious set of constraints.

It might be easier to claim that just as bother, as an implicative, presents no block against its complement's dependency on NEGATIVE, care also presents no block, although for some people it is not an implicative. This eliminates any need for tricks like the above, and neither NEG-RAISING nor NEG-ASSOCIATION is needed to explain (179a).

A sentence like (182), which Horn claims requires NEG-RAISING, can be explained easily.

- (182) Until midnight, I didn't care to leave until 2 a.m.

The lower until is satisfied by the NEGATIVE in its sentence, and the restriction on until midnight can be satisfied by noticing that didn't care is a stative predicate, as opposed to didn't bother. Sentence (182) with bother for care is ungrammatical.

So NEG-RAISING explains nothing unless a lot of other complicated restraints are added, and it looks like the same data without it.

5.5.2. In the same paper, Horn claims that NEG-RAISING can occur over the adverb even, which in his grammar is a higher predicate. His analysis of the meaning and presupposition which accompany also, even and only explain (he claims) why even allows NEG-RAISING and only and also don't.

Horn (132) states, 'Even, unlike also, permits NEG-RAISING. But the only semantic difference between also--which shares the assertion and non-uniqueness presupposition given [earlier]--and even is the negative expectation presupposed by the latter. And it is just this expectation which places even squarely among the NEG-RAISING verbs of expectation of [the class believe, think, etc.]'.

Assuming that this can be considered as an explanation for even's behavior, even and also have several other differences in behavior, both syntactic and semantic, and the same thing goes for even and only.

In an Interpretive Semantics grammar, even and only will not be higher predicates, but we still must explain why (183a) and (183b) are not synonymous like (184a) and (184b) are.

- (183) a. Only Paul didn't want to reunite the band.
- b. Not only Paul wanted to reunite the band.
- (184) a. Even Ringo didn't want to reunite the band.
- b. Not even Ringo wanted to reunite the band.

First of all, we will not derive these pairs of sentences from similar underlying structures. In each case, the not will be present in the deep structure just where it occurs on the surface. (See Jackendoff 1972: Chapter 8 for some discussion on this). I cannot go into the details here of how the readings of the not and even or only are put into the sentence. Jackendoff (1972) discusses that in his chapter on focus and presupposition. But the details are not important to this discussion. What matters is that the word only contains a modal operator of some kind. To see this, note that only can allow any in its scope, where even cannot.

- (185) a. Only Frank saw anything.
- b. *Even Frank saw anything.

This means that the modal scope structures of (183a) and (183b) will be different, since in (183b) only will be within the scope of not, but this will not be the case for (183a). This difference in modal scope relationships will be the explanation for the difference in meaning between the two sentences.

In (184a) and (184b), there is no difference in the scope relationship, since even does not contain a modal. Therefore it would make more sense for (184a) and (184b) to have the same reading.

This does not explain everything about the differences between these two sentences, of course. But it is a good place to start, and it suggests that there might be an easier way of accounting for the facts than to allow an adverb into the class of items which govern a rule, a class which contains no other such items.

For the difference between even and also, Horn gives no minimal pairs. For one thing, the places where also can appear are fewer than those where even can appear. Specifically, after a negative, also usually sounds bad:

- (186) a. *Not also Jóhn is coming.
 b. ??All the troops didn't also bómb the village.
 c. *My brother never also heárd of Bob Dylan.

In these sentences, even sounds much better.

This syntactic difference between also and even will also be reflected in the lack of synonymy between (187a) and (187b), since (187b) is not just different in meaning, but is ungrammatical.

- (187) a. Also George didn't want to reunite the band.
 b. *Not also George wanted to reunite the band.

So, in (188a) NEG-ASSOCIATION would put the also right into the scope of the not, as in (188b).

- (188) a. I don't believe also George wanted to reunite the band.
 b. *I believe not also George wanted to reunite the band.
 c. I believe also George didn't want to reunite the band.

NEG-ASSOCIATION in (188a) would give a reading of (188b), not (188c). Since (188b) is bad, (188a) is not ambiguous, but has only the reading without NEG-ASSOCIATION.

Horn mentions too as a variant of also in sentence (189) (= Horn's (25a)).

- (189) Abe doesn't believe that Sánta too will get here until midnight.

If too is considered as a variant of also, then the restrictions on not also seem to be more probably syntactic. Too doesn't appear in negative environments. In those cases it is supplemented by either, and (190) with either for too is a grammatical sentence.

- (190) a. Abe doesn't believe that Sánta either will get here until midnight.
 b. Abe believes that not Sánta either will get here until midnight.
 c. Abe believes that Sánta too will not get here until midnight.

(190b), with NEG-ASSOCIATION, sounds much better than the same sentence with also. And in a synonymous sentence with the not next to the verb like (190c) too may appear, since it is not in the scope of the negative.

So, there is evidence that the difference between even and also may be syntactic, which accounts for the differences in their behavior which Horn notices. The data can be given some sort of explanation in either framework.

5.6. Ordering of the rule.

5.6.1. It has been shown that in order for sentences (161a), (174a) and (176a) to receive their correct interpretations, NEG-ASSOCIATION must operate before the rule of VP-Anaphora. In addition, for sentence (143) to be interpreted correctly, NEG-ASSOCIATION must precede the rule which interprets tag questions. So far as I know, this creates no problems in the ordering of the rules.

There are some sentences which might suggest that other orderings are necessary. For example, in (191) it appears that, since the why not

- (191) Steve doesn't think that the Phillies will win and
I can guess why not.

refers to Steve doesn't think that..., of NEG-ASSOCIATION would apply, it would follow the VP-Anaphora rule. But I claim this could not happen. If the why not indeed refers to Steve..., then the first clause is reportive and NEG-ASSOCIATION could not have occurred in the sentence. On the other hand, if NEG-ASSOCIATION does take place, it will precede VP-Anaphora and the why not will refer to why the Phillies won't win. So there is no ordering problem there.

Another possibility is the following type of sentence from R. Lakoff (1969)

- (192) Steve doesn't think the Phillies will win, does he?

Since the tag is formed from the main sentence, it would seem that the tag-interpretation rule must precede NEG-ASSOCIATION, contrary to what we saw above, if NEG-ASSOCIATION indeed applies to this sentence. In fact, Lakoff claims that the NEG-RAISING transformation does apply in this sentence, and she avoids the ordering paradox between the two rules by making them cyclic.

But again, I would claim, this is not the case. I maintain that sentence (192) may not undergo NEG-ASSOCIATION, and therefore is not ambiguous.

The evidence that NEG-ASSOCIATION may not apply is given in the fact that the main clause is the one from which the tag is formed. Since, by the discussion in section 3.2.4, we decided that if think was being used expressively (which is required for NEG-ASSOCIATION to operate), it cannot be questioned. But the tag here would qualify as a questioning of think, so it must be reportive. Hence, NEG-ASSOCIATION does not apply to (192) and it need never follow the tag-interpretation rule.

5.6.2. There remains the question of the rule's having to iterate, i.e., to apply to its own output. In cases like the following,

- (193) a. I don't believe Archie wants Edith to know about this.
 b. I believe Archie doesn't want Edith to know about this.
 c. I believe Archie wants Edith not to know about this.

with either a transformation pulling the negative up, or a semantic interpretation rule moving the negative down, at first glance, it seems to make no difference whether the negative is moved in one jump or two. The transformation case was discussed in section 2.5.3.2, where it was decided that the rule must work one sentence at a time.

The interpretive rule may not move the negative downward in the semantic interpretation in one move for the exact same reason the transformation can't do it all at once. At each step the proper semantic/expressive forces must be present. G. Lakoff (1970a) spoke of such a rule as being anti-cyclic since it would have to apply on each cycle, moving downward. But, the option of being an all-at-once iterative rule is much more feasible in the case of an interpretive rule.

Consider the kinds of interpretive rules proposed in Jackendoff (1972). All of them help to build up the semantic interpretation. None of the rule actually replaces any part of representation that already existed (except for dummy elements) like the X in the functional or modal structure which is substituted for by the VP-Anaphora rule). The one that Jackendoff uses that could possibly have that effect, the rule for coreference, is specifically constrained to prevent it from marking any pairs which have already been marked. Other than that, there are no other rules which it would even make sense to apply to their own outputs. This contrasts greatly with syntactic rules, which are often movements of one type or another and which could conceivably go in ways to counteract each other (or themselves) if not constrained somehow by conditions like strict cyclicity mentioned above.

So even though the idea of an iterative semantic interpretation rule is new, there is no technical reason for excluding it, nor is there an intuitive reason.

6. Conclusions

This paper has been an attempt to take a closer look at a rule that has never had proper justification, even though it has had fairly wide acceptance. Since so many analyses have made use of the syntactic rule of NEG-RAISING, I felt it deserved some justification for its existence.

As the published evidence for the rule is reviewed it is seen that none of the arguments is without holes. In addition it was seen that the rule creates an ordering paradox, in that it must be both cyclic and post-cyclic. In the face of this obstacle, another approach was tried.

A too brief survey was made at the semantic properties of the predicates which allow the rule. It is hoped that in the future, some much more adequate way of representing meaning can be found, so that perhaps the quality of allowing NEG-RAISING will follow from the meaning of the predicates alone, rather than having to mark them all, arbitrarily for the rule, a scheme which makes absolutely no claims about any

semantic characteristics the predicates may share.

Kimball's observation that only expressive sentences may undergo the rule was looked at. It seems to be a correct generalization. Kimball, in his paper, claims that the classification may have wider uses than just for NEG-RAISING; for instance, in the distribution of it and so as pro-sentences. While the prospects of explaining different syntactic phenomena by using the distinction between expressive and reportive sentences seem encouraging, a formalism for representing the difference is still unavailable.

Having run into so many problems with a syntactic transformation, I made an attempt to describe the process using a rule of semantic interpretation called NEG-ASSOCIATION. The theoretical framework, that of Jackendoff (1972), was adopted.

It was noticed that certain verbs block their complement sentences from dependence on certain modals. This may eventually lead to a redefinition of the scopes of these modals, but in the meantime, the blocking was merely noted for its effect on some semantic rules and certain selectional restrictions.

After the rule of NEG-ASSOCIATION was formulated, the data were reexamined in the new framework and with the aid of the verb rule. In every case, the new approach was able to explain the data at least as well as a NEG-RAISING rule could, and in some cases, there seemed to be a better account of the facts.

While this paper cannot and does not attempt to justify the entire Interpretive Semantics framework it does aim to show that some of the problems which were claimed to be unsolvable in this framework (cf. G. Lakoff 1970a: fn. 4) can be handled without any more effort than Generative Semantics takes, and that new issues can be raised just as easily in one framework as in another. As long as a theory continues to provide new data to be explained, new questions to be answered, then it is a worthwhile channel for research. My intent here is to show that Interpretive Semantics is at least that, if not a lot more.

Footnotes

*This is a revised version of my M.A. thesis, originally submitted in 1974. I would like to mention three people for their assistance on this paper. First is Ray Jackendoff, whose ideological influence has been very large, both directly and indirectly. His work has inspired me to try to approach this grammatical problem from the angle I used. Secondly, my adviser, Arnold Zwicky, has instilled in me the rigor and professionalism I needed to keep from becoming more overzealous than I did. Finally, my wife, Caren, has put up more than her share of the bother with this thesis. To these three, thanks a lot.

¹This claim will be discussed further in section 3.2.4.

²This is not always true. It could be claimed that TOPICALIZATION can occur without the deletion, giving LEFT DISLOCATION. But most movement rules do not have copying counterparts.

³NEG-RAISING is not the only rule whose application would sometimes be ignored for identity purposes. Note also (i) with RAISING,

mentioned by Ross (1969).

- (i) Fred seems to be doing away with somebody but he won't say whom.

and (ii), the well-known example of the type from G. Lakoff (1966) involving RAISING and PASSIVE.

- (ii) Sue is believed by everybody to be pregnant, but she denies it.

⁴As in I don't see the Phillies winning the pennant.

⁵As in I don't mean for you to be insulted.

⁶Lakoff uses this as a basis for a claim that a semantic interpretation rule could not do the job, since it would have to be governed and hence the entire theory of exceptions and minor rules would have to be duplicated in semantics.

⁷A more detailed discussion of the issues raised in section 4.1.1. is given in Jackendoff (1972: ch. 1).

⁸All of the claims made for structures in this section are backed up in various places in Jackendoff (1972).

⁹There are some exceptions, cases where NPs marked with the are not specific--as in Claire wants to meet the man of her dreams, where the definite NP may still be nonspecific. These exceptions are not relevant to this discussion, however.

¹⁰Until, it will be remembered, can also be satisfied with a durative verb. This will not be considered here.

¹¹See Jackendoff (1972: ch. 7, fn. 3) for a justification of this structure.

¹²The verb doubt does not necessarily block dependence of a complement sentence from NEGATIVE. If it does, then the not refers only to doubt and (137a) will be grammatical (e.g., as read with heavy stress on don't).

¹³Baker (1970) claims that this 'cancelling out' of two negatives must be accomplished by means of logical entailment. I do not know what the implications are of including something like that in the semantic component of a grammar or even whether it is compatible with this system, if indeed he is correct.

¹⁴This discussion ignores the factive homonyms of care and bother, as does Horn.

References

- Akmajian, Adrian. 1970. Aspects of the Grammar of Focus in English. Unpublished Ph.D. Dissertation. M.I.T.
- Austin, John. 1962. How To Do Things with Words. Cambridge, Mass.: Harvard University Press.
- Bach, Emmon and Robert Harms, Eds. 1968. Universals in Linguistic Theory. New York: Holt, Rinehart, and Winston, Inc.
- Baker, C. Leroy. 1970. Double negatives. *LingI* 1.169-186.
- Chomsky, Noam. 1965. Aspects of the Theory of Syntax. Cambridge, Mass.: M.I.T. Press.
- Chomsky, Noam. 1970. Remarks on nominalizations. In Jacobs and Rosenbaum, 184-221.
- Chomsky, Noam. 1971. Deep structure, surface structure and semantic interpretation. In Steinberg and Jakobovits, 183-216.
- Chomsky, Noam. 1973. Conditions on transformations. In Stephen Anderson and Paul Kiparsky, Eds., *A Festschrift for Morris Halle*. New York: Holt, Rinehart and Winston, Inc., 232-286.
- Clinkenbeard, Joel. 1969. NOT-TRANSPORATION and related matters. Unpublished M.I.T. paper.
- Fillmore, Charles. 1963. The position of embedding transformations in a grammar. *Word* 19.208-231.
- Fillmore, Charles. 1968. The case for case. In Bach and Harms, 1-88.
- Fodor, Jerry and Jerrold Katz, Eds. 1964. *The Structure of English*. Englewood Cliffs, N.J.: Prentice-Hall, Inc.
- Grinder, John and Paul Postal. 1971. A global constraint on deletion. *LingI* 2.1.110-112.
- Gruber, Jeffrey. 1965. *Studies in Lexical Relations*. M.I.T. Ph.D. Dissertation. Reproduced by I.U. Linguistics Club.
- Hooper, Joan. 1975. On assertive predicates. In John Kimball (Ed.), *Syntax and Semantics*, Vol. 4.91-124. New York: Academic Press.
- Hooper, Joan, and Sandra Thompson. 1973. On the applicability of root transformations. *LingI* 4.4.465-499.
- Horn, Larry. 1971. Negative-transposition: Unsafe at any speed? *CLS* 7.120-133.
- Horn, Larry. 1975. Neg-Raising predicates: Towards an explanation. *CLS* 11.279-294.
- Jackendoff, Ray. 1971. On some questionable arguments about quantifiers and negation. *Language* 47.282-297.
- Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge, Mass.: M.I.T. Press.
- Jackendoff, Ray. 1975a. On belief contexts. *LingI* 6.53-94.
- Jackendoff, Ray. 1975b. Morphological and semantic regularities in the lexicon. *Language*
- Jacobs, Roderick and Peter Rosenbaum, Eds. 1970. *Readings in English Transformational Grammar*. Boston: Ginn & Co.
- Karttunen, Lauri. 1971. Implicative verbs. *Language* 47.340-58.
- Katz, Jerrold and Jerry Fodor. 1963. *The Structure of a Semantic Theory*. *Language* 39.170-210. Reprinted in Fodor and Katz 1964.
- Katz, Jerrold and Paul Postal. 1964. *An Integrated Theory of Linguistic Descriptions*. Cambridge, Mass.: M.I.T. Press.

- Kimball, John. 1970. The semantic content of transformations. Unpublished chapter from M.I.T. Ph.D. Dissertation, Categories of meaning.
- Kiparsky, Paul and Carol Kiparsky. 1970. Fact. In Manfred Bierwisch and Karl' Heidolph, Eds., *Progress in Linguistics*. The Hague: Mouton, Inc.
- Klima, Edward. 1964. Negation in English. In Fodor and Katz, 246-323.
- Lakoff, George. 1966. Deep and surface grammar. Distributed by I. U. Linguistics Club.
- Lakoff, George. 1970a. Pronominalization, negation and the analysis of adverbs. In Jacobs and Rosenbaum, 145-165.
- Lakoff, George. 1970b. Irregularity in Syntax. New York: Holt, Reinhart, and Winston, Inc.
- Lakoff, George. 1971. On generative semantics. In Steinberg and Jakobovits, 232-296.
- Lakoff, Robin. 1969. A syntactic argument for negative transportatin. CLS 5, 140-147.
- Lindholm, James. 1969. Negative-Raising and sentence pronominalization. CLS 5, 148-158.
- McCawley, James. 1968. The role of semantics in a grammar. In Bach and Harms, 125-169.
- Neubauer, Paul. 1970. On the notion 'chopping rule', CLS 6, 400-407.
- Perlmutter, David. 1972. Evidence for shadow pronouns in French relativization. In *The Chicago Which Hunt*, 73-105.
- Ross, John Robert. 1967. Constraints on Variables in Syntax. M.I.T. Ph.D. Dissertation. Distributed by I. U. Linguistics Club.
- Ross, John Robert. 1969. Guess Who? CLS 5, 252-286.
- Ross, John Robert. 1973. Slifting. In Maurice Gross, Morris Halle, Marcel-Paul Schutzenberger, Eds., *The Hague: Mouton*, 133-169.
- Steinberg, Danny and Leon Jakobovitz. 1971. *Semantics: An Interdisciplinary Reader in Philosophy, Linguistics and Psychology*. Cambridge: Cambridge University Press.
- Vendler, Zeno. 1967. Each and every, any and all. In *Linguistics and Philosophy*. Ithaca: Cornell University Press.